NATIONAL CAR BUILDER

VOLUME XIII.
NUMBER 6.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

$1.00 PER ANNUM
SINGLE NUMBERS, TEN CENTS.

NEW YORK:
Morse Building, 140 Nassau St.

JUNE, 1882.

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We are using it on all the freight equipment on the line.
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Supt. Machinery, L. & N. R. R.

We are especially pleased with it and shall continue the use of it.
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Asst. Gen. Manager, L. & N. R. R.

Our foreman painter reports of your paint to be the best he has ever used.
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It has given us entire satisfaction, and we are now using it exclusively on cars and similar work.
R. F. FIELDS, Master Painter,
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I shall use it on all my turbine wheels, as I think it superior to any other.
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We have adopted its use permanently for painting our engines, as we think it superior to any other. ERIE CITY IRON WORKS,
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We find it of very superior quality and shall use it on all of our railroad bridges and other iron work. WILKINS, POST & CO.,
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In grinding we find it takes from **ten to twenty-five per cent. less oil than various other brands of oxide of iron we have heretofore handled.**
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We have found it perfectly satisfactory and equal to any we have ever used.
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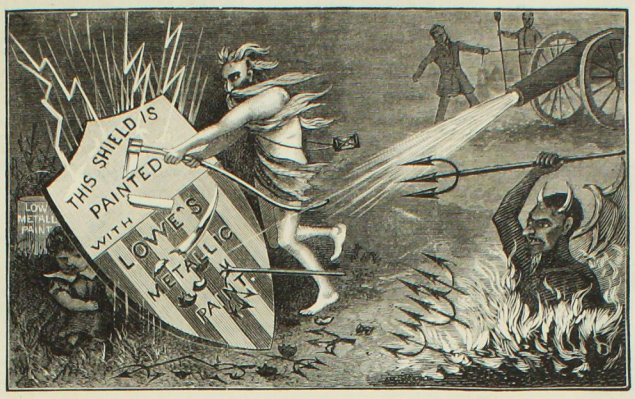
It is the best Mineral Paint we have used.
T. & H. SMITH & CO.,
Manufacturers of Wagons and Carriages,
Pekin, Ill.



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It is the best as well as the cheapest Paint we have ever used.
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We prefer it to any of the various other kinds of Metallic Paint we have ever used. Please send us another car load at once.
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Manufacturers of Sheet-Iron Roofing,
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We find your Paint of first-class quality and very economical. KING BRIDGE CO.,
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Your Paint gives us entire satisfaction.
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We like your Metallic Paint and shall continue to use it on our Sheet-Iron Roofing.
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Manufacturers Sheet-Iron Roofing,
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It gives us entire satisfaction, and we regard it as the best Iron Paint we have ever used. W. G. HYNEMAN & CO.,
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I consider it the best Paint I have ever seen for all kinds of Iron work, and is especially adapted for engines, boilers, and, in fact, any kind of machinery. J. W. BURK,
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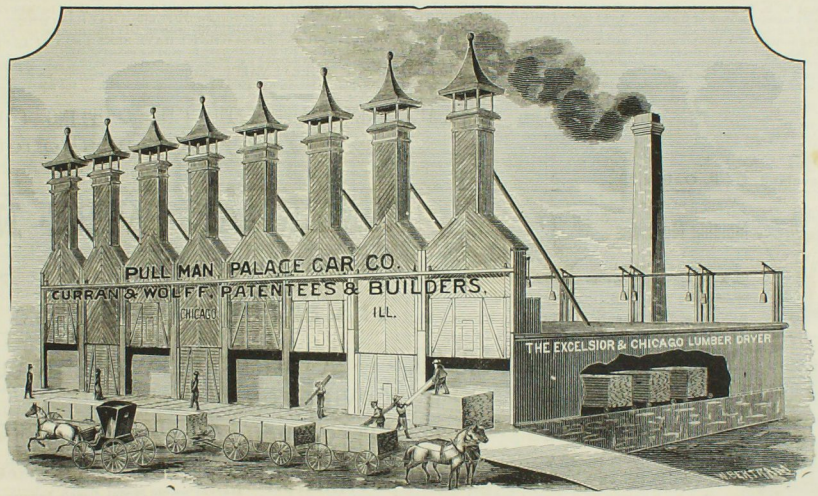

RAILROAD COMPANIES AND CAR-BUILDERS WHO ARE USING THE EXCELSIOR AND CHICAGO LUMBER DRYER.

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Wells & French Co., Chicago	3
C. & N. W. Railroad, Chicago	3
Flint & Pere Marquette R. R., Saginaw	1
Peninsular Car Works, Detroit	2
Michigan Car Company, Detroit	2
Louisville & Nashville Railroad, Louisville	2

	No. of Dryers.
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Ohio Falls Car Company, Jeffersonville, Ind	2
Denver & Rio Grande Railway, Denver, Col	2
U. S. Rolling Stock Co., Chicago	3
Chicago, Burlington & Quincy R. R., Aurora, Ill	2
Southern Car Works, Knoxville, Tenn	1
W. & W. Railroad, Wilmington, N. C	2

	No. of Dryers
Atchison, T. & S. Fe Railway, Topeka, Kan	2
Barney & Smith Company, Dayton, O	4
Missouri Car & Foundry Co., St. Louis	1
Jackson & Sharp Co., Wilmington, Del	2
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Billmeyer & Small Co., York, Pa	1
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LETTERS PATENT have not been taken out, so that any one using our goods runs no risk of being associated with any lawsuit. **NO INTERFERENCE** can be filed against the use of Ajax Metal; on the contrary, letters of recommendation from the leading steel and iron mills, foundries and machine shops of this country are shown upon application. Also reports of tests as made by MASTER CAR-BUILDERS and MASTER MECHANICS, who are acknowledged AUTHORITY. Full information given on application to

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HOOKS SMELTING CO.

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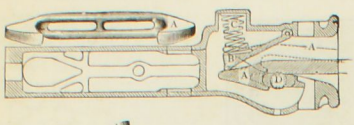
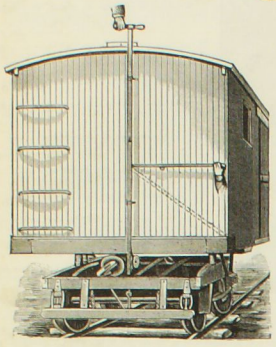


Among the many Automatic Car Couplers, few or none possess all the requisites of a perfect Coupler for freight cars. By this device we have overcome the many objections to other inventions. IT IS POSITIVELY AUTOMATIC.

Reference to the above cut shows how this Coupler is operated. The Hook-Link *A* is held in working position by the movable Lining *B* and Spring *C*. In the act of Coupling, the Hook-Link *A* slides over the Rockshaft *D* into its position.

In the act of UNCOUPLING, the Rockshaft *D* is rotated WITHOUT SLACK IN TRAIN, lifting the Hook-Link *A* up on top of the Rockshaft *D*, as shown by dotted lines, and ready to be withdrawn from DRAWHEAD. This is done from either TOP or side of car, by the use of levers, as shown in diagram, thus obviating the necessity of going between the cars.



When uncoupled it may be left so as not to couple, unless desired. Hook-Link can be elevated to an angle of forty-five degrees, to meet the variations of high and low cars. The ordinary link and pin (or in lieu the Hook-Link) can be admitted same as in ordinary Drawheads. THIS AUTOMATIC COUPLER CAN BE USED WHERE THE CONTINUOUS DRAWHEAD IS USED WITHOUT ANY ADDITIONAL EXPENSE.

This Coupler is made of the best REFINED AIR-FURNACE MALLEABLE IRON.

The HOOK-LINK and ROCKSHAFT is made of the best CAST STEEL.

Below is the test of strength of the Coupler and a few testimonials of its perfect working :

The Drawbar was held in an upright position, and the blows received on the head of the Drawbar. The Drop used weighed 1,600 pounds :

One blow at	2 feet.
One blow at	4 feet.
One blow at	6 feet.
One blow at	8 feet.
One blow at	10 feet.
One blow at	12 feet.

At the 12-foot stroke, showed a small fracture at small end.

TESTIMONIALS.

Over the signature of W. H. VANDEGRIFT, Superintendent Ohio Central Railroad Co.: I witnessed the working of your Car Coupler, and that I know it to be AUTOMATIC in Coupling, and that it uncouples without taking the slack of the train. And I say WITHOUT PREJUDICE that I think it one of THE BEST SELF-COUPLERS THAT HAS COME UNDER MY NOTICE.

Another prominent Railroad Superintendent says: IT IS POSITIVELY A SELF-COUPLER. IT IS EASILY UNCOUPLED without GIVING SLACK or RELIEVING the strain ON THE COUPLING. The ordinary link and pin may be used to couple these Drawbars, the same as common Drawbars. FROM WHAT I HAVE SEEN I SAY IT IS PRACTICABLE.

One of very recent date says: I have been favorably impressed with the device shown in cut for coupling cars. Kindly oblige me by sending model of same.

Another, from a very prominent gentleman who is deeply interested in railroads and their success, says: I have devoted some time to an examination of a new Automatic Car Coupler in charge of Mr. JOHN COUP, Agent Wapakoneta Car Coupler Company, and from my observations have no doubt of its GREAT VALUE. Railway corporations must adopt such methods as will not tend to accident in moving hand handling trains. There should be economy of life as well as money in railroading. This object would be promoted, no doubt, by the adoption of a Coupler such as shown by Mr. COUP.

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JOHN COUP, Agent,
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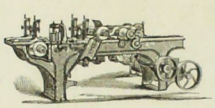
BLIND SHADE
Planing Machine FOR **CAR WORK.**

The most perfect Machine in use.

LEE'S PATENT
Molding Machines



Five different styles and sizes. These are especially adapted to all classes of car work.

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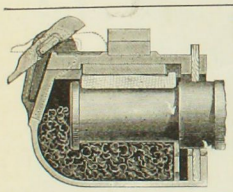

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We respectfully refer you to the following railroads using Hewitt Cover:
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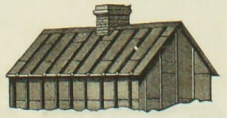

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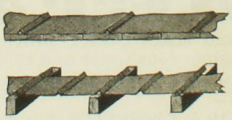
All kinds of Corrugated Iron furnished.



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A Practical Roadster, Safe from "Headers" or Other Dangerous Falls.

The means of propulsion insure a continuous power *without dead centres*—a conceded advantage in making the ascent of long steep hills, or going over rough, muddy or sandy roads.

The machine is durably constructed and is not liable to get out of order; is easily managed and guided, and the rider sits erectly, there being no tendency to make the shoulders rounded.

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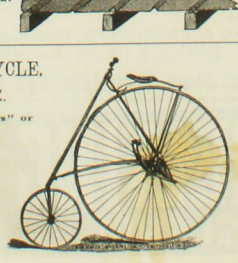

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USE THE
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THE FAMOUS
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IRON OXIDE PAINTS, ETC.
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DRY, GROUND IN OIL, READY MIXED.
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Largest Works in the United States.

FINEST, CHEAPEST, BEST.

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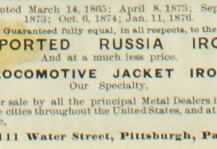

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Pulley Blocks and Iron Sheaves, Phosphor-Bronze Self-Lub. Sheaves, Ushers, Giant Car, $5.00 each. oor's Manual, 1880-81. See p. 53. lease write for lists, prices, etc.
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FOR SALE
BY THE
NATIONAL CAR-BUILDER,
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JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

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SIBLEY'S PERFECTION VALVE OIL.

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In exclusive use on 50 railroads.

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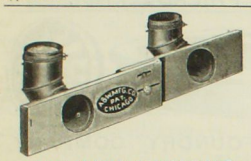

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In ordering give width of the sash.

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THE STANDARD LUBRICATING OIL OF AMERICA
FOR RAILROADS.
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ENGINE, COACH AND CAR OIL.
Gravity, 26°, 27°, 28°, 29°. Cold Test, 10° to 15° below zero.

No freezing in coldest weather, and entire freedom from hot journals at any time, as its exclusive use upon a majority of the leading railroads has demonstrated.

Showing Better Results than any Oil Extant.
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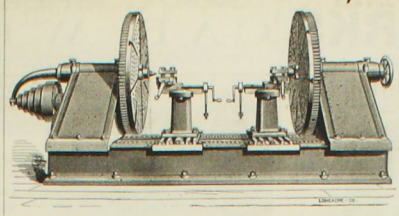

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TURN-TABLES, PIVOT BRIDGES, SHAFTING.

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DIRECTIONS.—For cars or engines, pack the box so that the Compound will come in contact with the bearing and journal, using waste saturated with oil; also moisten the Compound with oil. For shafting and places where waste can not be used, mix the Compound with oil, and apply to the bearing. If the bearing be very hot, the first application may run off, but two or three applications will cool it. When a journal is hot, don't cool it with water, but apply the Compound; **and no matter how hot it is, it will cool it while in motion.** When you apply new bearings, fill them with the Compound before putting them on the axle, and pack the sides of the box next to the bearing with the Compound, and your boxes will run cool. **For Sale by**

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Manufacturers of CAR AXLE LUBRICATORS,
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Spiral Spring four and a half inches high, four inches in diameter, fastened to a malleable iron top, containing a roller with bristles transversely inserted, the sides of the spring covered with felt and having one of the lips formed of the same material; when in position the outer edges of the concave roller are pressed against the surface of axles, the motion of which causes the roller and bristles to revolve and to distribute the oil in proportion to the velocity of the axles while the sides of felt saturated with oil act as "wipers" and lubricators; and the end lip performs similar duties, preventing waste of oil and the entrance of grit and dust.

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Smoke-Stack Black, and Colors Prepared for Passenger and Freight Cars, Specialties.

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FOR RAILROAD JOURNAL BEARINGS.

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OILS
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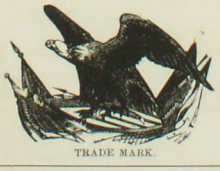
NO MORE HOT BOXES!

We can give the highest of references, including some of the best roads in the United States. We claim that our compound is a perfect cooler; saves brasses, and trouble and annoyance of frequent greasing. This is abundantly proved by our continual orders from railway companies, who are deriving the greatest satisfaction from its use.



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We sell in quantities of from five barrels to car loads and no charge is made unless it proves satisfactory.

We also manufacture the EAGLE MACHINERY AND CUP COMPOUND, which takes the place of Sperm and Lard Oil. It has been tested in Navy Yards and Engine and Machine Shops. Pamphlets explain further.

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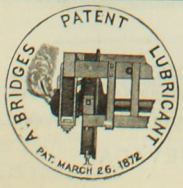

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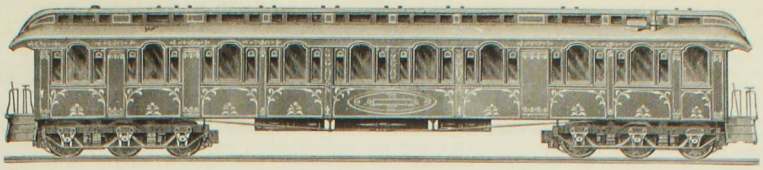
THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XIII. NUMBER 6. JUNE, 1882. SINGLE NUMBERS, TEN CENTS. $1.00 PER ANNUM.

Miscellaneous Items.

THE capital stock of the Cleveland Bridge & Car Works has been increased to $500,000.

BOWERS, DURE & CO., Wilmington, Delaware, are building 32 passenger cars for the Manhattan Elevated Railway.

THE Laconia Car Co., at Laconia, N. H., heretofore owned by John C. Moulton and Perley Putnam, has been organized as a joint stock company.

THE Billmeyer & Small Co. at York, Pa., recently delivered several handsome narrow-gauge passenger cars to the St. Louis, Des Moines & Northern road.

THE Southern States Coal, Iron & Land Co., of South Pittsburg, Tenn., is building 60 gondola cars of 36,000 lbs. capacity for the Cincinnati, Selma & Mobile road.

IT is reported that the Allen Paper Wheel Company have sent abroad for 19,000 steel tires. Why is this? Can not our steel manufacturers compete successfully for such orders.

A MONSTER locomotive has just been completed at the Fort Wayne shops of the Pittsburg, Fort Wayne & Chicago road. Its weight, without fuel and water, is 73,700 pounds.

THE Rochester Car-Wheel Works, recently in the hands of a receiver, have been reorganized on a solvent basis. Ex-Senator Barnum, of Connecticut, is President, and W. K. Chapin, Vice-President.

THE St. Charles Car Manufacturing Company, at St. Charles, Mo., have improved the capacity of their works, and can now turn out ten cars a day, every part of which, except the axles, are made at the works.

THE Central Vermont shops in St. Albans, Vt., are building four new passenger cars. They are 52 ft. long, have 42-in. wheels, and are supplied with all the latest conveniences. The inside finish is in mahogany.

A LARGE force of men are engaged in building wire fence on the State Line Division of the Pittsburg, Cincinnati & St. Louis Railway, near Pennington, Ind. The work is being done by the Western Fence Co., of Chicago.

THE passenger car trucks of the Charlotte, Columbia & Augusta road have 4x9 in. side timbers with, ¾x7 iron plate on the outside; also Muley axles and stop-wedges. The Alabama Great Southern uses a similar plate.

THE Ohio & Mississippi road has had 15 passenger cars built by the Jackson & Sharp Company, of Wimington, Del., after the same style as the standard passenger car recently adopted by the Baltimore & Ohio road.

THE Illinois Central Railway has just turned out two coaches with stationary wash-stands accessible to passengers, who are expected to carry their own towels—And hang 'em on the bell-cord to dry! Is that the arrangement?

THE Indianapolis (Ind.) Car Works now employ 592 men, and turn out 12 freight cars and 108 wheels per day. The shops have turned out 1,195 cars since they first opened in July, and have orders on hand for a large number more.

DURING the year 1881, the Kansas City, Fort Scott & Gulf Railroad Co. planted 250,000 catalpa trees, making 850,000 trees of all kinds planted. The catalpas have thus far grown very well and very rapidly, and do not seem to suffer from cold.

AN Indiana inventor has patented a portable bridge that can be easily carried on a flat car, to be used in case of a wash-out. The flooring, hand-rails and braces are run out with the bridge, being a part of it. It is designed for the transfer of passengers and baggage.

THE Long & Allstatter Company, Hamilton, O., are building a double steam punch and shears, weighing 36,000 pounds, for parties in New Jersey, and have recently shipped a 9-ton machine of the same kind to the Beaver Falls (Pa.) Steel Works and another weighing 13 tons to Grand Rapids, Mich.

THE Cattskill Mountain Railroad, now under construction, is 3 feet gauge, and will be 15 miles long. It will be equipped this year with 2 engines and 24 cars. Mr. Charles A. Beach is the General Manager and Superintendent, and John L. Driscoll, Master Mechanic.

THE shops of the Cleveland & Pittsburg road have been transferred from Cleveland to Wellsville, Ohio. The new location, it is claimed, has the advantage of being more central. The most important part of the company's work, however, is done at the shops on Preble avenue, Allegheny.

OUR last issue contained a paragraph saying that 8 locomotives were built in 1881 at the McComb City shops of the Chicago, St. Louis & New Orleans Railroad. This, we are informed, is an error. The engines were built at the Water Valley, Miss., shops of that road. The first-named shops built only 3 locomotives last year.

THE shops of the Chicago & Alton road, at Bloomington, Ill., have a chuck which holds a packing ring with eight "dogs" on the inside without springing it, and permits the ring to be turned on the outside and both edges before it is removed. The dogs are forced out by a cone which is moved over a center-pin with a nut.

THE American Society of Civil Engineers has undertaken to establish a uniform standard of time. If the society is not more successful in the "uniform standard" business than the Car-Builders' Association has been, people who travel east and west will have to keep on setting their watches at all the principal stations for a good while yet.

THE electric light is now illuminating the union depot at Pittsburg, making the waiting-rooms, offices, platforms and entrances brilliant in the surrounding darkness. While this splendid light is already extensively used in manufactories and business houses, even of the smaller class, it seems strange that it has not yet been more generally put to service in our great railway stations.—*Elevated Railway Journal.*

THERE are now 101 cars running that are equipped with Horton reclining chairs. They are distributed among 27 different roads, mostly at the West. Much the greater number run on 6-wheel trucks and with Allen paper wheels. These chairs have been steadily growing in public favor since they were first introduced four years ago.

M. FEIGEL & SON, manufacturers of steam and street cars, at New Utrecht, Long Island, are building narrow-gauge passenger cars for the Austin & Northwestern Railway, of Texas. They are also building cars for the Newfoundland Railway, and are shipping some in sections to Mexico, besides filling orders for street cars from various parts of the country.

THE Pennsylvania Railroad Co. has issued orders to all ticket agents to refuse to sell tickets to persons who are intoxicated, and all gatemen are instructed to pass no one who is under the influence of liquor. The company proposes by this means to protect itself against suits for damage from persons injured on the road while they are under the influence of drink.

THE Pullman Car Works in St. Louis are now running with a force of 300 men. The shops, which cost the company something over $100,000, have been in operation since last fall, and are exclusively engaged in repairing, repainting, and renovating the cars of the company run over the roads centering in St. Louis.

A RUSSIAN engineer has devised a novel method for testing locomotives, which, as soon as shops can be erected, will be used. The driving wheels will be raised a little above the rails, wheels are coupled and motive-wheels changed into flying pulleys. The rotary movement of the driving axle is transmitted by a belt to the principal shaft of the shop, which furnishes the power.

THE Ohio Central shops at Bucyrus, O., have just turned out a new locomotive, the first of five they are building; they are eight-wheel or American engines, with 17x24-in. cylinders, driving wheels 61 in. in diameter, the steel tires being 3 in. thick; they have 166 wrought-iron tubes, 2 in. outside diameter, No. 12 wire gauge; boiler, fire-box, cross-heads, axles, piston-rods, crank-pins and rocker-shafts all of steel.

THE railroads terminating at Chicago have determined to place in public warehouses all baggage brought in by their trains that is allowed to remain in their depots more than 24 hours after its arrival, and to charge 25 cents storage for the first day, and from 10 to 25 cents for each subsequent day after the first that the baggage is held in the warehouses. It will be held 24 hours free of storage after its arrival, and no more.

THE Jackson & Sharp Co. have just completed two very handsome sleeping coaches, called the "Elberton" and "Nahant," for the Wagner Car Co. All the latest improvements have been introduced, including a bridal chamber. The cushions are of a new design in old gold embossed plush. So says the Wilmington *Every Evening*. The "chamber" referred to is probably a retired apartment on the same level with the rest of the rooms, and doubly protected from intrusion by extra thick partitions and a powder-proof, combination door-lock. Or, perhaps, the cars have Mansard roofs, with an upper suite of rooms reached by a stairway.

THE shops of the Savannah, Florida & Western road are building a lot of 100 flat and box cars, and preparing to build two first-class passenger cars. This road has purchased the coach built by the Jackson & Sharp Co. for the Atlanta Exposition. All its engines are being equipped with Westinghouse automatic brakes. Four engines are in the shops for repairs. All its new engines have two Sellers' injectors and no pumps. The new Moguls have 17 × 24 cylinders and 4½ ft. drivers. The shops employ about 250 men.

In an article on railroad economy in *Van Nostrand's Engineering Magazine*, Prof. S. W. Robinson says, "Practice develops the fact that the outside rail on curves becomes by far the most worn. In some cases the outside worn rails, and inside nearly perfect ones, are interchanged, so that each shall get its portion of wear. The wear now referred to is mostly on the side of the rail head. The tops of the heads also become much worn. Altogether the wear on curves is much in excess of that on the tangents, a fact which accounts for laying heavier rails on curves.

"The fine theory of the 'coning of wheels' is entirely without force in practice. Wheels wear most near the flanges, so that in a short time the effective coning is reversed; that is, the wheels become smaller in diameter of tread at points near the flange than at points remote from it. It seems evident that the more wheels become thus worn and lose their coning, the greater will be their tendency to climb outward on curves, and consequently the greater will be their slip and the greater the wear, not only of wheels, but also of the rails on curves.

"The recent improvement in chilled car wheels of leaving an inch at the flange edge of tread without chill, will doubtless tend to make the wear more uniform over the whole tread."

A NEW invention is announced, the use of which, it is claimed, will considerably lessen the danger of railroad travel. It consists of a brittle metallic tube, which is to be made to project from the cab of a locomotive, being connected with the brake-pipe of the air-brake apparatus, whether Eames or Westinghouse. When a switch or draw-bridge is misplaced, wires fastened to it will operate two arms at some distance in either direction, so as to break this tube on the approach of a locomotive. In the Eames air-brake system, while the brakes are not in use a vacuum is maintained in the pipes; in the Westinghouse system a continuous pressure of air is maintained. In either case the breaking of the tube will at once set the brakes.

THE upright engine manufactured by the Westinghouse Machine Company is without doubt one of the most unique pieces of mechanism extant. The working parts of this engine are all inclosed within an iron cylinder, which is partly filled with lubricating oil, into which the wrist-pins and crank plunge at each revolution, making it impossible for the parts to either heat or wear. The Westinghouse people say, "If you want to lubricate do it thoroughly," and it would seem to be as economical to bury the working parts in oil as any other way when it is confined so as to prevent waste. These engines are capable of being run at an astonishing speed, cases being cited of their having made nearly 700 revolutions per minute.—*Railway Register*

MR. ISAAC M. VAN WAGNER, of Nyack, N. Y., has patented a cinder and dust-proof car window, which is thus described: Between the window and the blinds is a movable wire screen composed of very fine meshes, so fine in

fact as to most effectually prevent admission of dust or cinders; it does not, however, mar the view or check the circulation of air. The blinds, also, differ from those now in use in that instead of being stationary they have a motion which enables the passenger to fix them at such an angle as may be desired. They thus form a reflector for the light, an advantage which attracts considerable attention and admiration. The blinds, screen and window can all be used for their particular office, or all three conjointly.

THE Nashville, Chattanooga & St. Louis road is preparing to build a repair shop and a round-house of ten stalls at Chattanooga. A "Greenleaf patent non-tipping, one-beam turn-table" is already in place. The masonry of the pit is blue limestone laid in cement. This table is made of wrought-iron, is 50 feet long, and weighs about 24,000 lbs. It has a level platform, and carries the entire load upon the center rollers. This huge beam is so nicely balanced, and the steel wearing parts so accurately fitted, that the writer moved the platform, weighing about seven tons, with the point of a lead pencil without breaking the lead, and turned No. 11, one of the heaviest Moguls on the road, without lever or gearing.

SOME forty years ago or more, when eight-wheel passenger cars with an aisle or passage-way running through the center were first introduced, the new style of cars came before the board of directors of the Baltimore & Ohio Railroad for consideration. There was quite a discussion as to whether there should be an aisle in them, with doors at each end and seats as at present, or whether the cars should be in compartments, with entrances at the sides, and a ledge outside for the conductor. It was urged that the aisle would often be one long spittoon, the possibility of which was admitted; but other considerations prevailed, and the new plan was adopted. If these old-time directors had predicted that the spaces between the seats on each side would often be a puddle of saliva, they would have prognosticated truly.

AT the Georgia car shops (Carterville, Ga.), in erecting a car after the center sills and the intermediate and side sill on one side are bolted to the bolster, the body bolster truss-rods are put through these intermediate and side sills and bent down over the center sills to their places; then the intermediate sill on the other side is slipped up on the truss-rods and bolted to the bolster; next, the side sill is slipped on the truss-rods to its place and bolted down. In this way the work is done more easily and rapidly than can be done by driving the truss-rods through from one side after the floor-frame is put together, and the truss-rods have no kinks or other injuries from the bending and straightening.

THE shops of the East Tennessee, Virginia & Georgia road, at Knoxville, Tenn., are building a directors' car and rebuilding President Cole's car, which was badly injured in a recent collision. They are also building two cars to be equipped with the Blake rock-crusher for use in ballasting the road. The directors' car has two state-rooms with bedsteads, a sleeping-room with two Pullman berth sections, a parlor and an office, besides the usual closets. It will have a Richard's time and speed recorder, a Baker heater, Westinghouse automatic brakes and Miller platforms. It is 45 ft. long over the body, and has four-wheeled trucks with seven ft. wheel base. Under the body are the refrigerator and ice, coal and tool boxes. The outside is painted Tuscan red, the standard color of the road, with profuse gilt ornaments.

THE Richmond & Alleghany road is running twelve trains a day, and has put sleeping cars on the trains between Richmond and Lynchburg. The first of May it began running excursion trains to the Natural Bridge. This curiosity, in connection with the picturesque scenery in the James River Valley, makes this route a popular one for excursions as well as for a part of the round trip of tourists. The charming views of the Blue and Alleghany mountains, which the traveler gets as the train follows the curves of the river, which often doubles on itself, reminds a Scotsman of his beloved Highlands or a New Englander of his "delectable White Hills." The numerous dams, which were originally built to feed the now abandoned canal, cause the river to be a charming foreground or setting for an endless variety of delightful mountain scenery.

SEMI-STEEL flues, manufactured by the National Tube Works, are being used by the Mobile & Ohio; East Tennessee, Virginia & Georgia; Boston & Albany; Chicago, Burlington & Quincy; Eastern Illinois; Nashville, Chattanooga & St. Louis, and Wilmington & Weldon roads. The Chicago, St. Louis & New Orleans road is testing them. These tubes being much harder than iron tubes, are less liable to have leaking joints from contraction and expansion.

THE South Carolina Railroad car shops, at Charleston, S. C., employ 110 men. They are now rebuilding two coaches, and working on a lot of 50 flat cars of 40,000 lbs. capacity. In digging a pit for a turn-table in the shop yard a short time since they found an old journal and box. The diameter of the journal is 2¼ in. It is supposed to have belonged to one of the first freight cars of the road, which weighed 2,000 lbs., and carried a load of 6,000 lbs.

THE standard passenger car of the Richmond & Danville road is finished in chestnut below the window sills; the panels above are solid maple, and the trimmings and moldings are cherry; the clear-story is black walnut. Both the car and the clear-story are ceiled with alternate strips of maple and cherry 1¼ in. wide and varnished. The windows have rounded tops, and take a glass 30×26 in. There are no end windows in either the body or clear-story, but there are ground glass end ventilators, 10×26 in., placed above the top line of the side windows. These windows are hung on center pivots, and their openings are covered on the outside with fine wire netting. The trucks have 33-in. wheels, Muley-axles and stop wedges of the road's own design. The outside painting is Tuscan red, the road's present standard color.

WE have already alluded to the new dining cars of the Pennsylvania R. R. in a previous issue. A trial trip was recently made with one of these cars, and also a smoking car, between Jersey City and Long Branch. The smoking car is similar in style to the dining cars. It is finished inside with oiled mahogany, and contains card-tables, sofas and wicker-work chairs. The floor is laid with a dark gray carpet, and there is also a library containing the newest novels and other publications. This and the dining cars are adjuncts of the limited Chicago express trains. The table service of the latter is of silver, and was manufactured by the Gorham and Meriden companies; 4 large chandeliers give light at night, reinforced by 4 silver sconces on each side of the car holding wax candles. The ceiling of the car is ornamented with a new decorative material which resembles Castilian stamped leather.

THE standard engine of the Cherokee (Ga.) Railroad (3 ft. gauge) is of the American pattern and weighs 40,000 lbs.—28,000 lbs. on the drivers, which are 44 in. in diameter; cylinders are 12 x 18 in. One of these locomotives, which was built by W. H. Bailey & Co., at Connellsville, Pa., working steam at 135 lbs. pressure, takes a train of 18 loaded cars up a grade of over 100 ft. to the mile, and more than a mile in length, having reversed curves of 12° and long enough to have the whole train on the curves. The cars weigh 16,000 lbs., and carry a load of from 20,000 to 24,000 lbs., each being loaded either with 24,000 lbs. of pig iron, 5,000 ft. of green, or 5,500 ft. of seasoned lumber. The engine is doing this work regularly, and is run by C. W. Gearhart, an engineer who knows how to get the most work out of an engine by carrying three gauges of water, and handling the steam with the reverse lever with throttle valve wide open.

ABOUT 500 men are now employed in the car department of the Baltimore and Ohio shops, at Mount Clare. Within the last six months 26 passenger train cars have been built and 1209 freight cars. At present there are 13 new standard passenger coaches under way, and one a week is completed. A special car is also under construction for the United States Fish Commission. The passenger cars of the road are painted a chocolate color with a little gold striping. The sleepers are painted in the same way, except the letter-board, which is black, and the name of the car being placed centrally on the sides. A standard freight and tender truck has also been adopted. It is a rigid truck with arch-bars, wooden bolster and spring-plank, elliptic springs of the company's own make, and M. C. B. axles, boxes and bearings.

SIX new cars of the "Montgomery Palace Stock Car Company" have arrived at Baltimore from Milton, Pa., where they were built. They are intended, with others up to the number of 25, for service on the lines of the Baltimore & Ohio Railroad. The company was chartered in New York, and Messrs. Robert Garrett and other Baltimoreans are stockholders. These palace cars for cattle are buff color, are 32 feet long, 9½ feet wide, and considerably above the usual height. Each car is fitted for 16 head of cattle, and feeding-troughs and pipes for drinking-water are among the attachments. The feed boxes are at the top, and by a drop-bottom process the feed is emptied into the trough. The water is drawn through rubber hose from the tanks on the lines of road where the locomotives are supplied. The cars take the Janney coupler, and the Loughridge air-brake is to be added at the Mt. Clare shops. The Baltimore & Ohio is first to give this style of car a trial.—*Railroad Journal.*

THE Norfolk & Western road furnishes us the following record of a trial which was made to test the value of brick arches in fire-boxes for burning the coal used on that road. It shows the amount of coal burned in six trials of ten trips, each with a regular passenger train of five to seven cars from Lynchburg to Bristol and return over the heavy mountain grades. The total mileage of each trial was 4,080 miles. Engines No. 28 and 34 had an extended front end spark arrester and Allen slide-valve.

	Coal burned in 10 trips.	Coal burned per mile run.
No. 28, with hollow stay-bolts	242,115 lbs.	59.34 lbs.
No. 28, with hollow stay-bolts and brick arch	230,270 "	56.92 "
No. 34, with plain fire-box	287,356 "	70.42 "
No. 34, with brick arch	240,350 "	58.90 "
No. 36, with brick arch	263,320 "	64.54 "
No. 36, with brick arch	260,400 "	63.82 "

The brick arch is now used by the road on all its passenger engines.

THE Norfolk & Ocean View Railroad, 3-6½ gauge and 8¼ miles long, runs from Norfolk, Va., to a point on Chesapeake Bay, where a summer resort has been established in sight of Cape Henry and Fortress Monroe. In summer the road does a large passenger business, but in winter its traffic is confined to freight and materials. It has two double-ender locomotives, with tanks on boilers, 8 x 16 cylinders and 36 in. drivers. They were built by T. W. Godwin & Co., of Norfolk. The fuel used is anthracite coal, costing $6 per ton; and West Virginia oil, costing 44½ cents a gallon, is used for lubricating. The locomotive record for a month was as follows: Miles run, 1,400, or 700 per engine; miles run to ton of coal, 175; to pint of oil 43.75. Cost per mile run for repairs, 0.14 cent; for coal, 3.42 cents; for stores, 0.14 cent; for wages of engineers and firemen, 7.85 cents; the total cost being 11.69 cents per mile. The average train hauled was four loaded cars. The cars weigh 6,000 lbs., and carry a load of 20,000 lbs. The rails on the road are 30 lbs. to the yard.

THE New York Central & Hudson River Company has lately adopted a new and valuable improvement in locomotive signal head-lights, embracing the novel features of showing locomotive numbers at night, and colored signals to take the place of lanterns on the front of engines. On each side of the front rim of the head-light are two large colored bull's-eye signals, projecting at an angle of about 30 degrees to the axis of the reflector, and so situated as to be brilliantly illuminated by the rays of light proceeding from the reflector direct, which portion of the light is ordinarily lost as head-lights are usually constructed. Covers are provided, hinged, which are used when no colored signals are required. Above the front rim is a casing in which is mounted a colored signal pane, which can be lowered or raised in front of the light by the turn of a small thumb wheel, but when down it does not interfere with the reflection of the light on the track. These improvements do away with carrying colored lanterns in front of the locomotive.—*Rochester Express.*

THE Canadian Locomotive Engine Company's works, at Kingston, Ontario, Canada, though established about 24 years ago, have only within the past year developed into one of the most active industries of the Dominion. Its present proprietors comprise some of the largest capitalists and best-known business men in Canada. During the past year important additions have been made to the work-shops and machinery, and they are now said to be well equipped in every particular. It is admitted in Canadian railway circles that the engines built by this company last year, and delivered to the Credit Valley, the Welland, the Kingston & Pembroke, the International, and Canadian Pacific Railways, are of a type equal to any built upon this continent. The company is now engaged in finishing a contract with the Canadian Pacific, and when that is completed they will commence work upon contracts recently made with the Government for some narrow gauge engines for the Prince Edward Island Railway, as well as some heavy passenger and freight engines for the Quebec Central Railway. The capacity of the works is equal to five engines per month, but can be increased to fully fifteen per month should the demand warrant it.

IN the locomotive shops of the Baltimore & Ohio road, at Mount Clare, Baltimore, are several ingenious and original tools, which were designed by Mr. Jas. B. Hodgson, the shop foreman. One is a universal chuck for planing cylinders. After the cylinder is bored, it is put upon the chuck, which sets upon the bed-plate of a large planer that carries three cutting tools. When the chuck is properly placed upon the planer it does not require be moved, and every cylinder put upon it is brought to the exact centers for planing all the faces of the cylinder and the half of saddle cast with it, including the valve-seat and all, making the cylinders "rights and lefts," or perfectly interchangeable, as may be desired. Cylinders can be held upon it to be planed to fit the frames at any angle as well as horizontal. Its use saves nearly half the time required to do the same amount of work on any other planer without it. Another tool is an expansion mandrel for turning and refitting eccentrics and similar pieces. It holds the eccentric to an exact center, and then it can be moved by a scale which is attached, so as to turn the eccentric with any desired throw. This tool is so convenient and useful that one has been made and sent to each division shop on the line of the road. Among others, which are also well wooth copying, are a boring shaft, a machine for turning crossheads upon a lathe, and an inside chasing tool.

THE Wilmington, Del., *Every Evening* says that the Harlan & Hollingsworth Co. have shipped six more of the most elegant and superb sleeping cars ever built in that city. They are for the Chicago, Milwaukee & St. Paul road, and are part of a lot of nineteen, all of which have been completed and shipped. The interior finish consists chiefly of black walnut with French walnut veneers; the bunks have mahogany panels veneered with French walnut, and the centers and end-fillets are handsomely finished with inlaid woods. The ceilings are of oak, elaborately and beautifully ornamented; and the cars are lighted by two-light plated chandeliers of a new and ornate design. The height from the floor to the ceiling is 10 feet, giving greater height in the berths, and consequently additional comfort, carrying with them, indeed, in their general roominess, some faint extenuation of the broad and airy expanse of prairie across which they will soon be rolling. The wash-rooms are large and commodious, and are furnished with marble-top wash stands, plated pumps, etc., while there are large bevel mirrors on the bulk-heads as well as in the wash rooms. The floors are covered with the finest Brussels carpets. Spring-edge seats, covered with a rich shade of cherry plush; berth curtains and window curtains of the latest designs, and to match the balance of

the apartments, the whole, when fitted up, giving to the cars an air of comfort and luxury which can not but delight the traveling public. The elegance of the interior is rivaled only by the profuse yet delicate ornamentation upon the exterior, which is painted in the road's standard colors. The cars have six-wheel trucks.

THE Harlan & Hollingsworth Co. have built a very fine directors' car for the Atlantic & Pacific Railroad. The dimensions of the floor frame are 50 ft. by 9 ft. 4 in. The exterior is finished with continuous belt-rail and matched beaded boards. The interior is finished entirely with cherry, and is divided into office, kitchen, two state-rooms with water-closet between them, and parlor. The office and parlor are at opposite ends, with passage way extending along side of car. The office is also designed to be used as a dining room, and is provided with an upper and lower bunk, the upper one in Pullman style, the lower one formed by an extension sofa. There are separate closets for silver and glass ware, the latter attached to partition over the silver closet. The dining tables can be folded, and when not in use are placed against partition next the passage way. The kitchen is complete with every requisite convenience. The range is connected with two water taks fastened to the center of the roof and filled from the roof. The state rooms have beds 4 ft. in width, running crosswise the car, also wash-stands, pumps, tanks, etc. The parlor has an upper bunk and an extension sofa, windows running down 15 in. from floor, and mirrors between windows. The floors, except those of kitchen and closets, are laid with Brussels carpet, and the seating upholstered in crimson plush. The car is equipped with Westinghouse automatic brakes and double-acting hand brakes, and has Miller platforms inclosed with iron railings and gates. Underneath the car are four large storage boxes. The workmanship throughout is first-class in every detail, as might be expected from the experience and reputation of the builders. The H. & H. Co. have also built for the same road four passenger coaches and two baggage cars, the former with yellow pine inside finish and furnished with cane seats.

Two new sleeping cars, says the Boston *Traveler*, of May 5, to be run between Boston and New York, were turned out of the shops of the New York, New Haven & Hartford Railroad Company at New Haven yesterday and run down the road on a trial trip. In the completeness of their appointments and the elegance of their finish they are the finest cars ever built in New England, and are, without doubt, unsurpassed on any road in the country. They are named "New York" and "Boston," and each of them has been constructed with reference to strength and durability, as well as elegance. Both have six-wheeled trucks, which are very heavy. They are painted an olive brown and are lettered "New York, Springfield & Boston Sleeping Car." The name of each car is painted in the center in small ornamental block letters. They are fitted with 16 berths on a side or 32 in all, and are arranged so that they may be transformed into day coaches. The interior finish is of finely polished mahogany. The panels of the upper berths are of mahogany, inlaid with walnut and white holly, with ornamental vine work, the whole forming a very handsome design. The head-linings are of a special design. The material is card-board, of a kind which neither shrinks nor swells; it is painted in unique designs, and is fastened with intersecting bands of beaded black walnut. The window sashes are double and the windows are of heavy plate glass, with ground glass domes. The doors are very heavy and thick and of mahogany, with windows of cut-plate glass. They are fitted with an adjustable contrivance which holds them open at any required angle. Patent ventilating apparatus of the best design furnish a constant supply of pure air. The lamps, curtain rods, berth fixtures and all the trimmings are silver plated. Each car is provided with a handsome Wilton carpet. The curtains are of a wine color and are trimmed with silk plush.

RENEWING PAINT WITHOUT BURNING IT OFF.—The apparent cracking of paint on cars is frequently the cracking of the varnish only. When this is the case the car can be prepared for repainting by going over the surface with a sponge wet in strong ammonia and then scraping off the varnish with the wide square end of a spatula in two or three minutes after the ammonia is applied and before it is dry. This removes the first coat of varnish. If it is desired to remove another coat, it can be done by going over it again with the ammonia and following with the spatula. When the last coat to be removed is taken off, follow immediately with a plentiful washing with water to kill the ammonia, after which a little rubbing with pulverized pumice stone will give a smooth surface, which can be built upon with new coats of paint or varnish as may be desired. The same method applies to cleaning the varnish from the veneers or solid woods of the inside finish. The car can be prepared for new coats in this way in one-fourth of the time necessary to scrape it down. When the car needs repainting after the varnish is removed, a light coat of lead is applied, then the car is puttied where needed, and a No. 0 sandpaper gives it a smooth surface ready for the new color. A car can be got ready for this coat in two days with the work of three men; while it would take the same men over a week to burn off the old paint and give it a lead coat and rough-stuff it, and another week to rub it down.

Nuts and Bolts.

The want of an established uniform system for the making of nuts and bolts is the cause of no small amount of loss or trouble to manufacturers. Thus far the attempt to establish a system that would be generally adopted by the makers has been more successful in Europe than in the United States, although some progress in that direction has been made here. At the present time there are three systems in vogue in this country, viz.: the Whitworth, the V-thread, and the United States Standard. These systems, while possessing some merits, have more or less objectionable features. The Whitworth is adopted by all the principal English, Continental and Canadian bolt-makers. The threads by this system are made at an angle of 55°, with round top and bottom. Theoretically, the Whitworth system is good, but there are grave objections which may be urged against its practical operation. In actual operation, it is found almost impossible to make the rounds in the nut coincide with those of the threads of the bolt. The reason for this is, that it is almost an impossibility to keep the tools by which the taps are made, the taps by which the nuts are made, or the dies by which the bolts are made, in good condition, so that in constructing the threads on the bolt they may be made to fit those in the nut. It requires the best of workmen to keep the tools in condition, and in practice they can be hardly kept in order so as to make uniformly good and perfect work. Because of the glaring defects of this system, as developed under practical observation, it has obtained but little foothold in this country.

The V-thread system is the one in most common use. While, in some respects, this style is not so objectionable as the Whitworth, it is far from being a perfect system. The threads are V-shaped, and made at an angle of 60°, with sharp top and bottom. Some workman has jocosely, yet not inaccurately, termed this the "razor-edge system." In making this style of bolts, the threads are necessarily cut very deep, thereby weakening them. When the taps are new, they will cut a clear, sharp thread in the nut, but after the tap becomes worn, the tops of the threads get rounded, and thereafter will not make a sharp, well-defined bottom to the nut. So, when the bolts, that are supposed to be cut with a sharp thread, are screwed in the nut, they will not fit those tapped after the tap has become rounded, *i. e.*, they will not fit on the sides of the thread but only on the top, which every mechanic knows is not a desirable fit, as bolts thus fitting will, after slight wear, become loose. The same troubles that occur in the rounding of the top of the thread of the tap happen to the top of the thread of the dies. The two objections, working together, are the productive cause of the bad-fitting bolts and nuts made under this system. Every maker of this style, having his own ideas as to the proper number of threads to the inch, makes his own taps and dies after his own notion, which results in the lack of uniformity seen in this kind of bolts.

The third system of bolt making is that called the U. S. Standard, and suggested in 1864 by the Franklin Institute of Philadelphia. This has been adopted by the United States in all the navy yards and armories. Several leading railroads and manufactories have likewise adopted it and are pleased with it. This system makes the threads at an angle of 60°, with one-eighth the pitch, flat top and bottom. Although it is claimed by many that this system is not so theoretically correct as the Whitworth, yet in practice it has been proven to be altogether the best yet suggested. Better fitting bolts and nuts are insured by this method, because we are more likely to have the threads fit on the sides than on the top and bottom. The taps are easily constructed and easily kept in repair. Any workman of ordinary ability can produce better results with this system than a superior workman can with the others. The body of the bolts is not cut away as in the V system, and therefore the making of a stronger bolt is insured. The chief objection to the Standard system, however, is in the number of threads adopted in the three smallest sizes, which are as follows: for ¼ inch bolts 20 threads to the inch; $\frac{5}{16}$ inch 18 threads, and ⅜ inch 16 threads. Now in practical operations, it is found that these bolts when cut to standard are weak, because the pitches are so coarse that the body of the screw is cut away, making it liable to break. The fault is not in the threads stripping, but in the parting of the body of the bolt. Then for the same reason the taps are also weakened, and having so much cutting away to do they can not stand the strain put upon them, and hence are liable to break. Observation teaches that 22 threads to the inch for ¼ inch bolts, 20 for $\frac{5}{16}$ inch and 18 for ⅜ inch make much stronger bolts, and the taps for them are also stronger and can be made to stand the pressure brought upon them. The other sizes, as provided by the U. S. Standard system, are thought to be correct. Some of our leading manufacturers have already adopted the modifications suggested by increasing the number of threads to the inch in the three smallest sizes, and have found that the change is desirable.

It may be asked, why don't all the manufacturers unite upon a common standard? There are obvious reasons, chiefly their reluctance to make a change. They dislike the trouble necessitated in the change, and all are not agreed upon what is really the best system. But there would be but little trouble in this respect should they undertake to thoroughly investigate the matter. The bolt-makers cannot be charged with blame, as they furnish what their customers demand and will supply them with any kind they may desire.

One thing is sure, uniformity is desirable, and our best manufacturers are anxious that it may be brought about. How to do this is another matter. As there can be no coercive power employed, the only means at hand, it seems to us, is a thorough agitation of the subject. It would be well for the scientific and mechanical associations to thoroughly discuss the question and offer such suggestions as in their judgment would stimulate the change. When the leading manufacturers of the land can be prevailed upon to adopt a general system, the lesser lights will be sure to follow.—*Industrial World.*

High Railway Speed.

Mr. W. Barnet Le Van, in an interesting paper read before the Franklin Institute, Philadelphia, on "High Railway Speeds," stated that in his opinion railroad rivalry would, before the expiration of five years, reduce the time from New York to Philadelphia to one hour. The Pennsylvania Railroad, with all its drawbacks, with eighty-four curves varying from 5,730 ft. (1°) radius to 639 ft. (9°) in 88 miles, regularly every day accomplishes a speed of fifty miles per hour. The total curvature on this road from Philadelphia to New York would describe over ten complete circles. If the roadbed were straight between the two cities, there would be no alteration required to run the high speed of 90 miles an hour; but upon a curve the outer rail must be more or less elevated so as to counteract the centrifugal force of the train due to its velocity. On the Pennsylvania Railroad the super-elevation is one inch for each degree of curvature up to five inches as maximum, which is never exceeded regardless of the speed or curvature in degrees; that is to say, by its rules the engineer, on approaching a curve of 3° radius at the rate of 50 miles per hour, must slack down his speed to 40 miles to correspond to the super-elevation of the outer rail. Curves are not objectionable on the score of loss of power, though highly so from their wear and tear of locomotives and cars, displacement of rails, danger, etc. The danger of running off the track is also greatly increased.

Earthwork of a road costs almost nothing for repairs proportioned to its length, as is also the case with fuel, wages, wear and tear of the locomotive and cars; it will therefore be advantageous to make large expenditures in building a straight and level road in the first place.

Another important question in moving passengers at high speeds is how to diminish the dead weight of cars. The power required to overcome the resistance due to the mere weight of a passenger at a speed of 90 miles an hour on a level is but about 1½ horse-power, and 100 passengers would require about 150 horse-power. But while this would carry the live weight of the train, it will require from twenty to thirty times as much power to pull the whole weight, live and dead. As our trains are now made up to carry from four to eight tons of passengers, we put in motion a train weighing from 110 to 150 tons—a train in which the locomotive alone weighs 35 tons, most of the rest being dead weight. According to the report of one of our leading railroads for 1878-9, the average weight of cars in passenger trains was estimated at 110 tons, and the average number of passengers carried was 60.1 to 60.4, which gives 3,666 pounds of car hauled per passenger. On the Pennsylvania Railroad, the average carrying dead weight to paying weight is 16 of dead weight to 1 of paying weight. In closing his highly interesting theme, Mr. Le Van quoted the language of Mr. John Burroughs regarding ill-ballasted railroads, as follows: "Our railroad system, no doubt, has certain advantages, or rather conveniences, over the English; but for my part I would rather ride smoothly, swiftly and safely in a luggage van (baggage car) than be jerked and jolted to destruction in the velvet and veneering of our palace cars. Upholster the road first, and let us ride on bare boards until a cushion can be afforded; not till after the bridges are of granite and iron and the rails of steel, do we want this more than aristocratic splendor and luxury of palace and drawing-room cars."

A SUBSTITUTE FOR BLACK WALNUT.—Black birch, which is rapidly coming in favor, is a close-grained and very handsome wood, and can be easily stained to resemble walnut exactly. It is just as easy to work, and is suitable for nearly, if not all, the purposes to which black walnut is at present applied. Birch is much the same color as cherry, but the latter wood is now very scarce, and consequently dear. It is a difficult thing to obtain cherry at $50 a thousand feet, while birch wood can be had at any sawmill at $1 per thousand feet. When properly stained, it is almost impossible to distinguish the difference between it and walnut, as it is susceptible of a beautiful polish equal to any wood now used in the manufacture of furniture. In the forests throughout Ontario birch grows in abundance, especially if the land is not too boggy. There is a great difference in the wood of different sections. Where the land is high and dry the wood is firm and clear; but if the land is low and wet the wood has a tendency to be soft and of a bluish color. In all the northern regions it can be found in great abundance; and, as the tree grows to such a great size, little trouble is experienced in procuring it in large quantities.—*Toronto Globe.*

Communications.

Strength of Boilers.

The pressure tending to burst the cylindrical part of a boiler is $P = D \times L \times S$. P being this pressure, D the diameter in inches, L the length in inches, and S the pressure per square inch. To calculate the bursting and working pressure of the shell of a boiler, we may assume its length to be one inch, as the length is not a factor which influences the result by being increased or diminished, so far as the pressure alone is concerned. That is, if the bursting pressure of a boiler 5 ft. long is considered in comparison with another boiler 10 ft. long, but similar in all other respects, it will be found that there is twice the total area subjected to pressure in the 10 ft. boiler than there is in the 5-ft. boiler, but there is also twice the area of metal in the 10-ft. shell. Hence the area of metal to resist internal pressure increases in the same ratio as the area of pressure is increased by increasing the length alone. In stationary boilers the length may be and frequently is an important factor, as the boiler, if very long and insufficiently supported at proper intervals of its length, may add a very destructive element to that of the pressure of the steam through the unsupported weight of the boiler itself.

The pressure required to pull apart a bar of iron one inch square (good boiler iron) is 50,000 lbs.

If we now assume a boiler to be 48 in. in diameter, single riveted and of $\frac{3}{8}$-in. iron, and of a length of one inch, we have to resist the internal pressure. A section of boiler shell of one inch in length and $\frac{3}{8}$ in. in thickness on each side of the boiler, or a total section of $\frac{3}{4} \times 1$ in., the strength of which is three-quarters of 50,000 lbs., or 37,500 lbs.

It has been demonstrated by trial that the strength of a single riveted joint possesses but 56 per cent. of the strength of the solid metal. As the boiler is 48 in. diameter and the strength of the shell is 37,000 lbs., if the same were without joints, we have $\frac{37,500}{48} = 781\frac{1}{4}$ lbs., as the pressure per square inch necessary to just equal the strength of the shell. But as the strength of any structure is measured by that of its weakest portion, and a single riveted joint has but 56 per cent of the strength of the solid sheet, as already stated, it follows that the real strength of the boiler is but 56 per cent. of $781\frac{1}{4}$ lbs., or $437\frac{1}{2}$ lbs. That is, an ordinary locomotive boiler, single riveted, would burst at that pressure if the shell were made of $\frac{3}{8}$ iron of 50,000 lbs. tensile strength. A factor of safety of *four* is frequently used, although one of *five* or *six* would be safer. Assuming a factor of safety of *four*—which means that the working pressure is $\frac{1}{4}$ of the bursting pressure—we have $\frac{437.5}{4} = 109.3$ lbs., as the working pressure. A well-proportioned double or staggered riveted joint has been proven to possess 70 per cent. of the strength of the solid sheet, which would give in the assumed boiler 546.87 lbs. as the bursting pressure, which, divided by four (factor of safety) gives 136.71 lbs. as the working pressure. In ascertaining the pitch or distance apart of the rivets, from center to center, the shearing strength of the rivets should be compared with the tensile strength of the sheet left between the holes. To do this, a given length of the joint may be assumed, the sectional amount of metal left between the holes ascertained and multiplied by the tensile strength of the sheet, making a deduction of 15 per cent. for injury done by the punch. The sectional area of one rivet may be ascertained, and the same multiplied by the number of rivets, and again multiplied by 50,000 lbs., as the shearing resistance of rivets, is about equal to the tensile strength of good boiler iron. This applies to the ordinary form of single riveted joints, as if the joint is formed by butting the sheets with a covering strip on each side it is evident that the rivet must be sheared in two places, which doubles its resistance. With $\frac{3}{8}$-in. iron in the shell, of 50,000 lbs. tensile strength, and a single riveted joint, it will be found that a $\frac{7}{8}$-in. rivet, with holes spaced $2\frac{3}{8}$ in. from center to center, will give the strongest joint of this description. The double or staggered riveted joint is much stronger than the single riveted. In a joint of this description in $\frac{3}{8}$-in. iron sheets, using $\frac{7}{8}$-in. rivets, it will be found that with $1\frac{3}{4}$ in. between the holes on the zig-zag line, will make the strongest joint, giving about 70 per cent. of the strength of the solid sheet.

As ordinarily constructed, the fire-box of a locomotive boiler is by far the strongest portion, as with iron plates $\frac{3}{8}$ in. thick, with stay-bolts 5 in. apart from center to center, gave way with a strain of 9,000 lbs., and with similar sheets, with stay-bolts 4 in. apart, the destroying pressure was 16,000 lbs.

The following rules apply to stayed surfaces:

To find the thickness of plates of stayed surfaces: Multiply the square root of the pressure in pounds per square inch, by the greatest distance between the stays in inches, and by .008, the product equaling the thickness of the plate in inches.

To find the area of a stayed surface in square inches, which can be safely supported by stays of different diameters: Divide the working strength of the stay in pounds by the working pressure in pounds per square inch; the quotient equals the area in square inches. The working strength of stays is:

$\frac{7}{8}$-in. diameter, 8,000 lbs.
1-in. diameter, 10,000 "
1-$\frac{1}{8}$-in. diameter, 13,000 "
} Deducting 10 per cent. the rod is reduced by thread.

The dimensions of stay-bolts is found thus: Multiply the area supported by the stay in square inches, by the pressure of steam in pounds per square inch; the sum divided by 9,000 equals area of stay-bolt in square inches, if the stay is increased in diameter where threaded; and if not, that is, if the thread is cut on the body of the stay, divide by 6,000 instead of 9,000.

To find the dimension of a crown-bar: Multiply the the thickness of the bar in inches at the center by the square of its depth at the center in inches, and by 30; divide the product by the length of the span in inches, and the quotient is the *working load in tons equally distributed.*

To find the pressure borne by the crown-bars: Multiply the span of the roof in inches by the pitch of the crown-bars in inches, and by the pressure in pounds per square inch, and divide by 2,000; the result being the pressure uniformly distributed, borne by each crown-bar, *in tons.*

For the distance apart of stay-bolts, Haswell says: Multiply the square root of the quotient of 6,900 for iron and by 5,000 for copper stay-bolts; divided by the maximum working pressure, by the diameter of the bolts, and the product will give the distance in inches.

TABLE

of working pressures of locomotive boilers in pounds per square inch:

Inside diam of shell in inches.	Thickness in inches.	Double riveted, double welt.	Double riveted lap.	Single riveted lap.
30.....	¼	187	166	140
	$\frac{5}{16}$	235	209	174
	$\frac{3}{8}$	281	225	209
33.....	¼	170	151	127
	$\frac{5}{16}$	212	189	159
	$\frac{3}{8}$	255	227	190
36.....	¼	156	139	116
	$\frac{5}{16}$	195	174	145
	$\frac{3}{8}$	236	209	174
39.....	¼	145	128	108
	$\frac{5}{16}$	181	160	129
	$\frac{3}{8}$	218	192	161
42.....	¼	134	119	100
	$\frac{5}{16}$	169	148	125
	$\frac{3}{8}$	201	179	150
45.....	¼	125	111	94
	$\frac{5}{16}$	156	139	117
	$\frac{3}{8}$	187	166	140
48.....	¼	117	104	88
	$\frac{5}{16}$	146	130	110
	$\frac{3}{8}$	176	156	141
51.....	¼	110	98	82
	$\frac{5}{16}$	137	122	102
	$\frac{3}{8}$	165	146	122
54.....	¼	104	92	77
	$\frac{5}{16}$	130	115	96
	$\frac{3}{8}$	156	138	125
57.....	¼	99	88	74
	$\frac{5}{16}$	124	110	92
	$\frac{3}{8}$	149	132	111
60.....	¼	94	83	70
	$\frac{5}{16}$	118	103	88
	$\frac{3}{8}$	141	125	105

The following table will facilitate the getting of the superficial areas of ordinary locomotive flues of different diameters and lengths:

AREAS OF FLUES.

Length of Flues		1¾ inch Flues. Outside Surface in sq. ft.	1⅞ inch Flues. Outside Surface in sq. ft.	2 inch Flues. Outside Surface in sq. ft.	2¼ inch Flues. Outside Surface in sq. ft.
Ft.	In.				
9	0	4.123	4.417	4.712	5.303
9	1	4.161	4.458	4.756	5.352
9	2	4.200	4.499	4.800	5.401
9	3	4.238	4.539	4.843	5.450
9	4	4.276	4.580	4.887	5.499
9	5	4.314	4.621	4.931	5.548
9	6	4.352	4.662	4.974	5.597
9	7	4.391	4.703	5.018	5.646
9	8	4.429	4.774	5.062	5.695
9	9	4.467	4.785	5.105	5.774
9	10	4.515	4.826	5.149	5.708
9	11	4.543	4.867	5.192	5.842
10	0	4.581	4.908	5.236	5.981
10	1	4.620	4.948	5.280	5.940
10	2	4.658	4.989	5.325	5.989
10	3	4.696	5.030	5.367	6.038
10	4	4.734	5.071	5.411	6.087
10	5	4.772	5.112	5.454	6.136
10	6	4.811	5.153	5.498	6.185
10	7	4.849	5.194	5.541	6.234
10	8	4.887	5.235	5.585	6.283
10	9	4.925	5.276	5.629	6.332
10	10	4.963	5.317	5.672	6.381
10	11	5.000	5.357	5.716	6.430
11	0	5.040	5.398	5.760	6.479
11	1	5.078	5.439	5.803	6.528
11	2	5.116	5.480	5.847	6.577
11	3	5.154	5.521	5.891	6.626
11	4	5.192	6.562	5.934	6.675
11	5	5.230	5.603	5.978	6.724
11	6	5.269	5.644	6.021	6.774
11	7	5.307	5.685	6.065	6.823
11	8	5.345	5.726	6.109	6.872
11	9	5.383	5.766	6.152	6.921
11	10	5.421	5.807	6.196	6.970
11	11	5.460	5.878	6.240	7.019
12		5.498	5.889	6.283	7.068

The strength of locomotive flues to resist external pressure is much greater than the strength of the shell to resist internal pressure, and it is very rare that a flue collapses unless it is worn very thin or has a flat place on it. The general formula for strength of flues to resist a collapsing pressure is

$$V \times \frac{t^2}{ld}$$

in which t is the thickness in inches, l the length in feet, d the diameter in inches. V is a variable value dependent on the thickness and may be selected from the following

TABLE.

For lengths from 1½ to 10 feet:
From .043 to ⅛ in. V = 380,000 to 520,000.
" ⅛ to ¼ in. V = 520,000 to 650,000.
For lengths from 10 to 18 feet:
From ⅛ to ¼ in. V = 650,000 to 720,000.

In examining boilers which have been in use, to set a working pressure for the same, the hydraulic test is frequently used. This is, however, not entirely reliable, and should be used, if used at all, after an examination by the "hammer test." A thorough examination of the inside of the boiler for furrowing, pitting, cracks, etc., should be made and every square foot of the inside subjected to the hammer. Pitting is indicated by a raise in the surface of the scale which, if knocked off will disclose a few drops of a dark fluid which indicates that the pitting or corrosive action is going on. If, however, no fluid is found under the scale, the corrosive action has stopped. Furrowing or grooving is found at the joints, and is especially dangerous, as the contracting and expanding action of the boiler uses the parts weakened by grooving as a lever, working at every change in temperature. Grooving and pitting may sometimes be stopped by sending the engine to another division where a change of water can be had; cutting out the sheets injured (as all sheets are not attached in the same boiler) sometimes stops the action.

If the boiler stands up well under the hammer test and develops no cracks, which can best be found by a magnifying glass, the strength of the boiler should be based on the thinner portions—bottom of grooves. When the grooving action has extended to from $\frac{1}{16}$ to $\frac{1}{8}$ in. deep, the boiler is dangerous at any pressure, as it will be generally found if the hammer is applied first to these localities and the magnifying glass next, that minute cracks have developed, which should condemn the sheets attacked. The grooving acts very much like nicking a bar of iron to break it off, and when the action has developed to any extent it is dangerous to a greater degree than the mere thinning of the sheet.

Cracks and other leaks can be easily located by noticing if the scale is thicker or raised in any one place. Leaks cause this action of scale by the attraction of the current of water seeking the crack as an outlet. A light hammer about the size of a tack hammer is best in testing stay-bolts. If a broken stay-bolt is struck by a heavy hammer, the force brings the broken ends into contact, deceiving the person who has his hand on the other end of the stay-bolt. If a person holds a lead pencil between his teeth, applying the opposite end to the ends of the stay-bolts, while the other ends are being tapped with a light hammer, he will very readily determine which are solid and which are broken. However, stay-bolts which have wasted away in the water-leg to $\frac{1}{4}$ in. or less in diameter and are still solid are not detected by this means, and an actual examination is then the only plan of detecting dangerous stay-bolts.

A very easy way of applying the hydraulic test to the locomotive is to fill the boiler full of water and then push the engine ahead with both pumps open. If the boiler be filled *entirely* with water, and no leak is present, it can be easily tested by building a light fire in the fire-box, when the gauge will almost instantly begin to show pressure, as the water is incompressible, and every degree of heat expands it. No danger can result from the fire, as the maximum pressure will be reached long before a dangerous degree of heat has been transmitted to the fire-box. As the pressure raises very rapidly, owing to the solidity of the water, the blow-off cock should be in shape to be opened instantly when the maximum is reached. In case a weak spot is found in the boiler and an opening is made, no injury will result to by-standers, as the water will not have been heated to the boiling point. It should be carefully looked after that there are *no leaks*, as this plan depends for its safety on this point.

FRANK C. SMITH.

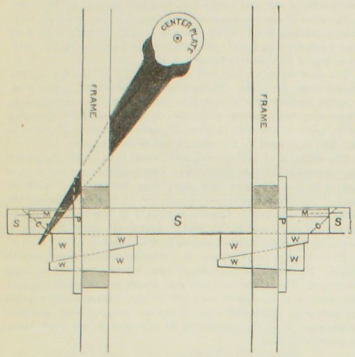
Overhauling Locomotive Driving Boxes.

To the Editor of the National Car-Builder:

The May number of your valuable journal contains a communication from Mr. Frank C. Smith on the overhauling of driving boxes and wedges of locomotive engines, in which he states that he places a center on the engine frame between the front pedestal jaws; which center is the length of main rods from center on guides between "striking points."

This plan would work very well, *provided* the main rods were the proper lengths. I have very often found in overhauling locomotives, that one rod was longer than the other, or both rods too long or too short. Now suppose we were overhauling a Rogers engine, the main rods being too long or too short. If we lay off our wedges by the length of the main rod, one wedge will be thicker than the other, just the same as one rod brass in its crown might be thicker than the other, as Mr. Smith states. I think, and have always been taught, that to lay driving box wedges off irrespective of length of rods is the proper way, the centers from which to lay off the front shoes, being exactly in the center between the pedestal's jaws. Then make the rods the proper length if they were not, doing the same in blacksmith shop, and *not* by making one brass thick and the other thin, as Mr. Smith would have us do if our rods were not the proper lengths. I square the front shoes by center-plate of engine, using a "fish-tail tram," as shown in cut, having a scriber placed in a hole bored through this tram near its end. I place against the face of the pedestals a straight-edge S longer by from three to five feet than the distance between the frames. This straight-edge I secure

firmly by the use of wooden wedges, *w w*. I then scribe an arc of a circle c on this straight-edge from center-plate with the tram, by use of the scriber through the hole near the end of tram, as before stated. I place against the outside of frame directly on top of straight-edge a small straight-edge, or what is better, "a parallel-strip" *P*. I then place against this strip a scale, *m*, and draw a line at its end and directly across the circle before scribed with tram from center-plate. It is very evident that the circle is crossed by a line equally distant from frame on both sides of engines; and if the intersection of the lines



and circle be the same distance from edge of straight-edge on which we make them, the engine pedestals are "square," as a machinist would say, or at right angle to the cylinders, *provided* the center-plate was in its true position. Instead of using sticks with centers on them, as Mr. Smith proposes suggests, I would use a tram made in the following manner: Take a piece of ¾ or 1-in. gas pipe, and place on it two trammel points, both bent in same direction towards the front of engine. This tram can be placed against the front shoe, and we can caliper the back ones with this tram, having it set with side-rods first for length without using any centers at all.

Mr. Smith conveys his center to top of the frame, after already having it on the side of the same. Will Mr. Smith please explain why he goes to all that trouble? Quite a number of the machinists in the Western railroad shops have read his article, and can not understand why he conveys the length of rod to top of frame after having it placed first on the side. The wedges can all be laid off with a pair of hermaphrodite calipers to size of boxes, after using tram to plane the shoes to. I have used Mr. Smith's plan; in fact, I used to lay them off in the same way he does; but I find by using the tram as explained above, that I can overhaul the driving boxes and wedges in about one-half the time that it takes to do it by his plan.

MONTGOMERY, ALA., May, 1882. W. F. TEAT, JR.

Decay of Decorative Art.

A great deal of fun has been poked at Mr. Oscar Wilde, the great head-light and apostle of æstheticism, but he can say some good things notwithstanding. Take the following from a recent lecture in New York, as a sample:

"I believe the decay of decorative art is this century is due to the want of joyous colors and stately drapery in dress. Our dress drives the painter back to the romantic ages, and almost annihilates the sculptor. Indeed, when we see the productions of modern sculptors we wish we had annihilated sculpture completely. For when we look at the statues of our departed statesmen in bronze frock coats and double-buttoned, marble waistcoats, we feel as though we had added new horrors to death. The only well-dressed men I saw in this country were not the dandies of Fifth avenue, but the miners in the Rocky Mountains. Everything they wore had a natural sense of rightfulness.

"To remedy the lack of art in handicraft you should have a good school of design in every city, and a museum of decorative art attached to it. A good designer must learn how to see and think in color. Your designers should be taught in the school of Whistler, which starts with the key notes of color. For here I find a want of scheme—even in the houses of the wealthy only a collection of incongruous pretty things. Your decorative art schools should teach simple, useful things for simple people, instead of teaching their scholars how to paint moonlights on soup plates and sunsets on dinner plates. Leave to the painter the art of giving undying beauty to the beauty that dies away and fades.

"Art does not depend on books, but on the enjoyment of nature. That depends first on a healthy atmosphere. I saw Cincinnati from a distance wrapped in a pall of soot and smoke, and I felt there was no use for a school of art there. Then, too, you want a healthy physique and individualism. If your sculptors want models, don't let them go among the idlers of Fifth avenue, but to the docks. I noticed, too, an absence of wood carving on your wooden houses, which for the most part were painted in most depressing colors. Your jewelry, too, is coarse in conception and design. The purpose of precious metal is not fulfilled when it is turned into a vulgar dollar. In your hotels I was often obliged to drink my chocolate and coffee out of cups ¾ of an inch thick, whereas in the house where the Chinese navvies supped in San Francisco my tea was served in most delicate china.

"In every school I would have a workshop where children can be taught designing, in addition to the criminal calendar called History. There is such a school in Philadelphia, founded by my friend, Mr. Leland, and these brass shields of simple beauty" (holding up the shields on the table) "were made by a girl of 13; this simple wooden bowl, that would gladden any kitchen, was made by a girl of 13, and this tasteful design of a water vessel by a girl of 9. If you wish for art you must revolt against the luxury of riches and the tyranny of materialism. Let your art be made by the hands of your people for your people."

Necessity and Invention.

Given the best material, ample facilities and a high order of inventive skill to devise something new, such material, facilities and skill had much better be turned to other account if there be not a demand for the article in question. Invention is the offspring of necessity in the fullest sense, and unless the something produced fills a niche in the wall of wants, the inventor had better have devoted his brains, time and material to other employment. It is the disregard of this phase of the great natural law of "demand and supply" that cumbers the patent office with specifications of so many inventions that come to naught. The number of improved boot-jacks, rat-traps and miscellaneous articles which have been patented is legion. Men mistake invention for a business, and enter into it as they would into selling dry goods or making shoes; possessing a knack for invention they bring forth an array of articles intended for almost every use in the calendar. Some of these are very cunningly contrived, no doubt, but the reason why they fail to bring remuneration to the inventor for the time, labor and money expended in perfecting them is, that the world's economy does not require them. There has been a waste of forces. The vital trouble lies in the fact that these inventors look at the matter from the wrong end. They set about to make "something," trusting that its radically new character will find a place for it, instead of trying in the first place to discover what thing the exigencies of this or that trade demand. Sometimes one of this class will succeed in hitting upon a valuable invention. We will say that his work is some piece of mechanism connected with cotton manufacture. He immediately begins to adapt the principles of his invention, or a modification of them, to iron-working or some other branch of industry, and oftentimes loses what he gained in his mania for inventive experiment. The "professional" inventor rarely succeeds in the long run.

And yet the field for invention is by no means closed. There is every encouragement to-day for inventive genius. Great and revolutionary as have been our improvements in machinery, industry awaits and will pay for others. There is need of more perfect appliances for treating cotton between the field and the factory; a machine is wanting to manipulate jute and like fibers, to the end that we may make such staple products and compete with the poorly-paid labor of countries across the water. A fortune awaits the successful inventor in these and many other fields, but in every one the necessity must first exist. In many instances the pressure of circumstances almost compels the invention of the thing desired. We see this nowhere better illustrated than in the annals of prison life. Some of the most curiously contrived tools known to mechanical experts have been fabricated by prisoners in their endeavors to escape. Here an imprisoned convict, lacking tools or material, contrives to make a key by scraping lead from a water pipe, melting it in a spoon over a fire made from splinters of his furniture, and casting it into form, and with it opens intricate locks. Others perform almost superhuman feats in the way of producing inventions for cutting iron bars, drilling through iron doors, breaking through heavy stone walls, and constructing ladders, weapons, files, saws, hammers and other tools. The same conditions exist where legitimate invention is concerned. It does not depend so much on the facilities that the inventor has at his command as on the necessity for the thing which he seeks to produce.—*Metal Worker.*

The Block System.

A work has recently been published in England on railways and locomotives, which embraces the following views relating to the block system, expressed by John Wolfe Barre, M. Inst. C. E.:

Viewing the block system as a whole, it may be safely said that it has the advantage of being perfect in principle, in so far that it renders collisions impossible, provided it be carried out perfectly; whereas the system of time signaling, even granting that it can be carried into effect without a flaw, gives no absolute security against collisions. * * * The objection—viz., its liability to failure from human fallibility—is frequently urged against the block system, but it really is not an objection against that system in particular. It applies to every other known system of signaling, excepting only an automatic system of signals by which trains should signal themselves. A purely automatic system, however, implies absolute reliance on machinery which may get out of order, and which cannot deal with emergencies as can be done by an intelligent and experienced signalman. The great object to be aimed at is to simplify the task which each signalman has to perform, to arrange that every signal made between two signalmen should be checked in order to insure its having been correctly given and correctly understood, and to simplify the transmission of signals between the signalmen and the engine drivers. Thus, in answer to the first question, it may be stated that the electric telegraph supplies all that is required to make the block system sufficiently perfect for railway signaling, though as yet perfection has not been obtained in the means by which the block system is carried out.

In answer to an objection that the block system delays trains and reduces the traffic, Mr. Barre says: It may with truth be asserted that if a railway be properly divided into block districts, proportioned to the speed and to the greatest number of trains to be accommodated, the block system is capable of dealing with any amount of traffic which, for other reasons, is practicable. But it is, no doubt, the fact that where a railway is not properly divided, or where an exceptionally large amount of traffic is for a day or two thrown on a district which is laid out for a much smaller amount, the result under the block system may be more or less delay. This is, however, a small matter compared with the safety which the system gives, and it can always be rectified, either by dividing the line properly, or, in exceptional cases, by temporary arrangements, such, for instance, as attaching two or more trains together and allowing them to proceed in company.

The East River Suspension Bridge.

The following statistics of this remarkable structure will give an idea of its magnitude. Its entire cost, and the date of its completion, are items which will be forthcoming in due time:

Construction began January 2, 1870.

First rope thrown across the river, August 14, 1876.

Depth of the New York foundation below high water mark, 78 feet 6 inches.

Depth of the Brooklyn foundation below high water mark, 45 feet.

The New York tower contains 46,945 cubic yards of masonry, the Brooklyn tower 38,214.

Weight of the Brooklyn tower about 93,079 tons.

Weight of the New York tower, about a third more.

Size of the towers at high water line, 140 × 59 feet; a roof course, 136 × 53 feet.

Height of the towers above high water mark, 276 feet 6 inches.

Height of roadway in the clear in the middle of the East River, 135 feet.

Grade of the roadway, 3 feet 3 inches to 100 feet.

Width of promenade in center of bridge, 15 feet 7 inches.

Width for railway on one side of the promenade, 12 feet 10 inches.

Width of carriage way on the other side of the promenade, 18 feet 9 inches.

Length of main span, 1,595 feet 6 inches.

Length of each land span, 930 feet.

Length of the Brooklyn approach, 1,506 feet.

Length of each of the four great cables, 3,578 feet 6 inches; diameter, 15¾ inches; number of steel galvanized wires in each cable, 5,434; weight of each cable, about 800 tons.

Weight of steel in the suspended superstructure, 10,000 tons.

Precautions Against Accidents on the Erie Road.

Mr. Benj. Thomas, Superintendent of Transportation on the New York, Lake Erie & Western road, in his testimony before the New York Senate Committee appointed to investigate the Spuyten Duyvil accident, declared that whatever system might be adopted, the safety of passengers depended ultimately and inevitably on the fidelity of the men in charge of it. He explained the system of promotion on the Erie road, saying that men never became conductors until they had served long as brakemen, and that from the day they entered the service it was hammered into them that their first duty was the safety of their trains. The best conductors were promoted into the dispatchers' offices, but a man was never made chief dispatcher of a section until he had served in the office as a subordinate. The conductor was held directly responsible for sending back a flagman if his train were delayed. Besides, the rear brakemen, who were selected from the most reliable men, also understood it was their duty to go back. Half a mile was the distance prescribed, and he believed the rule was carried out. Near the terminus in Jersey City trains ran at intervals of but a few minutes, but they went very slowly. On the road there was always at least 15 minutes interval between trains of the same speed, and 10 minutes between an express and a way train following it. These he thought the least intervals consistent with safety.

The company does not use an interlocking switch, but contemplates adopting it. He thought an automatic signaling arrangement might be devised. He said that where roads of different companies cross, the engineers had instructions to slow up, so as to be able to stop at once if the signal was against them. He admitted it would be safer if they came to dead stop, but later on added that it would not be convenient either for the company or the public. The company was preparing to light the cars with gas, which he thought would cause no such danger as oil does. Fire extinguishers had been found unreliable and were abandoned, but buckets were carried. He thought it

would complicate matters to have both a train agent and a conductor.

Engineers are paid $3.60 a day; conductors, $3.45; brakemen, $1.80; switchmen, $1.80; trackmen, $1.10. The engineers and conductors work about eight hours a day, the switchmen twelve. Regular men are assigned to regular trains.

Mr. Thomas also said that a perfect block system insures perfect safety, but a permissive one increases danger; but every system depends on the fidelity of employés, and rules and regulations are always necessary. He considered the sounding of wheels an important test, and that broken journals and wheels are frequent causes of accident.

The Term "Engineer."

The extensive use of the term "engineer" in the sense of a man of education and scientific attainments, who designs work and directs the efforts of others, has raised the question in the minds of some members of the profession whether some other word than this cannot be devised for designating those men who tend engines. The English term "engine driver" has been suggested for this class of men, leaving the term "engineer" to be applied exclusively to the man of education. While this distinction may seem very desirable in the minds of some, we doubt if such a change is necessary. We think it hardly possible that any great confusion can ever arise. It certainly would be difficult to effect a change as radical as this in habits of writing and speaking that are already formed. Should the engineers who manage engines ever become ashamed of their brothers who design engines, it will be a proper thing for them to take some steps to originate a term by which they can be designated without fear of mistake. Seriously speaking, if any distinction in terms is to be made, or if a new name is to be introduced, it should belong to the educated members of the engineering profession. The usage of centuries is not easily changed by arbitrary distinctions. From time immemorial the term "engineer" has been applied to those in charge of engines—not necessarily steam engines, for the term is older than the invention of the steam engine, but to those who managed engines of war and mechanical devices of various kinds. The attempt at the present time upon the part of the educated gentlemen of the profession to restrict the use of the term "engineer" to themselves, to the exclusion of those who perhaps know as much, but who make less pretensions to academic honors, may be only another instance of an engineer hoist with his own petard.—*Iron Age.*

Yellow Pine.

That yellow pine is a valuable wood, and one available for general building purposes, there can be but little doubt. It is neither too light nor too weighty. It is worked with tolerable facility, and is easier to handle than the hard woods. As a substitute for white pine it has no rival. The large amount of it growing in the Southern States, and the gradually diminishing supply of white pine in the North, make it certain that it will become a leading source of lumber supply in the future. The large purchases of southern lands by northern lumbermen, of late, is an indication that their sagacity leads them to the same conclusion. Yellow pine has enough intrinsic merit to force its way into various uses. For car-sills it is thought highly of by many manufacturers. It is regularly employed by Wells, French & Co., the Pullman Car Company, the Illinois Central Company, the Haskell & Barker, at Michigan City, Ind., and others in the Northwest. At St. Louis a large amount of yellow pine piece stuff is sold, and no doubt the time will come when it will be distributed from this market. It certainly may be expected to become a rival of white pine west of the Missouri in process of time. In Texas, the fine long-leafed pine of the Sabine country is being used for almost every building purpose, and the true Southerner wants no better lumber than that which grows on his native plains. But in the North, especially in the Northwest, until white pine is far more nearly exhausted than now, southern pine cannot enter into general competition with white pine for building purposes. For those uses to which it has peculiar adaptability it will gradually come into favor in this market, and continually more so as white pine grows scarce and high of price. But thus far it has made its way under difficulties.—*N. W. Lumberman.*

CLEANING BRASS.—The government method prescribed for cleaning brass and in use at all the United States arsenals is claimed to be the best in the world. The plan is to make a mixture of one part of common nitric acid and one-half part sulphuric acid in a stone jar, having also ready a pail of fresh water and a box of sawdust. The articles to be treated are dipped into the acid, then removed to the water and finally rubbed with saw-dust. This immediately changes them to a bright color. If the brass has become greasy, it is first dipped in a strong solution of potash and soda in warm water; this cuts the grease so that the acid has free power to act.

So far, the efforts made to pass a five-cent fare bill through the Assembly have failed.—*Elevated Railway Journal.*

How can a five-cent fare bill be passed through the Assembly without "passes?"

Standard Passenger Car—Chicago & Alton Railroad.

WE give herewith two full-page illustrations of the standard passenger car of the Chicago & Alton Railroad Co.; and also engravings representing the standard passenger truck of the road. Twelve of these cars are now running on the road, one with each day and night train on the lines between Chicago and St. Louis, and Chicago and Kansas City, and it is the intention to increase the number on some of the trains. Two more of the cars are in course of construction at the Bloomington shops. They are all furnished with Horton reclining chairs—from 32 to 40 to each car. These chairs, instead of being reversible, are made so as to turn on a pivot, and have also an automatic head-rest and an adjustable leg and foot-rest. Each chair is independent of the others, and can be used by only one passenger. The seat cushions are easily removed for cleaning; and as they are all exactly alike and interchangeable, there is no trouble in replacing them. Under the front edge of the seat is a lever connected with a ratchet and pawl, which enables the occupant to adjust the chair with the greatest ease to almost any angle, and hold it in such position. The upright and reclining positions of the chairs are shown in the two small detached engravings. The chairs can also be turned so as to face each other without interference or crowding, and are in fact an admirable arrangement by which passengers can have a sleeping couch by day or night, as well as a parlor and reading chair. For the large number of people who wish to travel only a part of the night they are especially convenient, and on this account have materially increased the local night travel on the roads using them. We give below the principal specifications and details of construction.

The general style of inside finish is sufficiently varied to avoid monotony. Those now under construction have decorated oak head-linings. The cabinet work is in oak, cherry and maple in Eastlake style of ornamentation. The chairs are upholstered in crimson plush and have nickel-plated trimmings. At one end of the car is a Baker heater and ladies' toilet, and at the other end a smoking-room, closet and gentlemen's toilet. The lighting is by three Hitchcock lamps, and the ventilating appliances are all that can be desired.

DIMENSIONS.

Length of body over end sills	49 ft. 11 in
Width of body over side sills	10 " 1⅝ "
Height, bottom of sill to top of plate	7 " 3¼ "

BODY TIMBERS.

2 Side sills	hard pine	7½ x 5½ in.
4 Intermediate and center sills	" "	6¼ x 5½ "
2 End sills	oak	7½ x 7 "
2 Cross-ties	"	4½ x 6½ "
4 Bumper arms	"	4 x 8 in. x 16 ft.
4 Horn timbers	"	4 x 8 " x 12 "
4 Side pieces	"	4 x 8 " x 4 "
2 End platform timbers	oak	6¼ x 8 in. x 8 ft. 9 in.
8 Rising blocks	"	4 x 5½ "
Bridging is	"	1⅝ x 6¼ and 2⅜ x 6¼ "
4 Corner posts	ash	3½ x 6¼ in.
4 Door posts	"	3½ x 6¼ "
72 Posts	"	2½ x 3¼ "
48 Cripple posts	"	2½ x 3¼ "
48 Upper deck posts	hard pine	2 x 4 "
2 Belt rails	ash	1⅜ x 4¾ "
4 Ribs	"	1⅜ x 1⅜ "
2 Side plates	hard pine	2 x 4½ "
2 End plates	ash	3¼ x 16 "
2 Side arms	"	1¾ x 11½ "
2 Main end carlines	"	1¾ x 5½ "
112 Carlines	"	1¾ in. thick.
2 Upper deck sills	hard pine	4½ x 2 in.
2 Upper deck plates	" "	2½ x 4 "
62 Upper deck carlines	ash	1½ in. thick.
2 Sign boards	whitewood	1¼ x 11½ in.

CONSTRUCTION.

The end sills are mortised to receive double tenons from each long sill; they are secured to side sills by wrought-iron angle irons ⅜ × 6 in., which are bolted to both end and side sills, and to intermediate and center sills by joint bolts ⅝ × 13½ in.

The cross-ties are each secured to the sills by one ⅝ × 11 in. bolt in each sill, passing through sill and cross-tie with nuts and washers on under side; each has one ¾ in. truss rod.

The car has four transoms, each made of two wrought-iron plates ⅜ × 6 in., the upper plate having a lip ⅜ × 4 in. welded on each end, to secure the ends of the bottom plate.

The first transoms from the ends of car are secured to each side sill by two ¾ × 10 in. bolts; the second transoms take truss rods clips, and are secured to side sills by two ¾ × 11 in. bolts.

The side bearings are formed by trusses, which extend from first to second transoms, and are secured at each end between upper and lower plates of transoms by two ¾ in. bolts.

Upright Chair.

The center-plates are two in number, and are carried between the first and second transoms on trusses, the ends of which are secured to transoms by ¾ bolts and lips.

There are seventeen ⅝ rods running across the car under the floor, from outside to outside of side sills, with nuts and washers on each end, located alongside of bridging, as shown in drawing.

The draft-timbers are fitted to receive transoms, and each timber is secured to center and end sills by ¾ in. bolts.

There are two 1¼ truss-rods under the side sills, running from transom to transom, with a queen-post and brace secured to each cross-tie.

The lining or "deafening" on under side of car is of ⅞ × 5½ in. matched white pine, secured to under side of sills and bridging by 8d. nails.

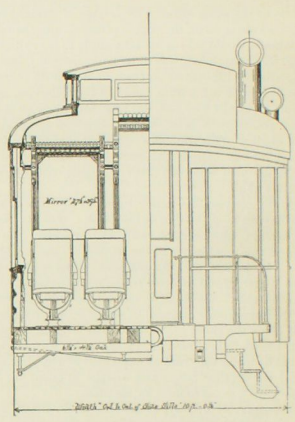
The floor is of best quality hard pine, 3 × 1¼ in., running lengthwise of car, and nicely matched and secured by 8d. nails.

The sides of car are secured by thirteen ⅝ in. rods on each side, extending from top of plate to bottom of sill, with nuts and washers on each end; each end of car has four ¾ in. rod from top of end plate to bottom of sill.

The sides under the belt-rail are supported by bracing on the Howe truss principle. There is also a truss-rod ⅝ × 2 in. iron, running horizontally on each side, under window sills and inside of bracing, from outside to outside of transoms; then dropping at an angle of about 45 degrees, it passes down through the side sills and is secured by 1¼ in. nuts and bevel washers.

The siding is of best quality whitewood ⅛ in. thick, the paneling dividing the side of car into five sections; center section taking in four windows; the other four sections two windows each. The panels are trimmed with No. 14 iron strips under the windows. The car is furnished with T. B. Blackstone's safety platforms and couplers, by which device all slack in train is taken up by right and left screws in draw-bars.

There are five iron carlines, ⅝ × 2 in., across car from plate to plate. These carlines are shaped like roof and secured at ends to plates. The upper deck sills and plates are secured together by thirteen ⅝ in. rods on each side of car, with nuts and washers on each end. Main and upper decks are covered with matched white pine, ⅞ × 3 in., secured by 6d. clinch nails; the whole being covered with tin.



End View and Section.

Inside of roof is finished with oak head-lining nicely ornamented and paneled with ⅝ × 1½ in. mahogany beaded strips.

The sides are finished with mahogany pilasters extending down to truss plank with red oak panels over windows nicely ornamented. Between the windows are heavy plate glass mirrors 11 × 39¼ in., framed with mahogany moldings.

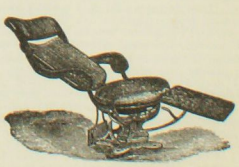
The window openings between posts are 34¼ in. Windows have upper and lower sash; upper glass 10½x31 and lower glass 25x31 French plate, with black walnut sash. Each window is provided with a curtain on balanced roller.

At one end of the car are the ladies' toilet room, and room for Baker heater; at the other end are gentlemen's toilet and smoking rooms.

Faces of partitions at each end are finished with mahogany pilasters and moldings, inclosing large plate glass mirrors 27½ × 39¼ in. to correspond with finish of sides; also vestibule door in each partition hung on double-acting hinges.

The car is mounted on four-wheel trucks, with 42-in. Allen paper wheels. Wheel base, 8 ft.; offset in equalizers, 11½ in.; pendulum body-hangers; Mulley axles, 85⅝ in. long; journals, 3⅝ × 8⅛, furnished with Bissell stop wedges; wheel seat, 5 in. Bolsters rest on French's quintuple elliptics, 36 in. centers, 12½ in. set, and containing 5 leaves 4½ × 3 in. steel; the journal springs are Culmer four-coil 8 × 10 in.

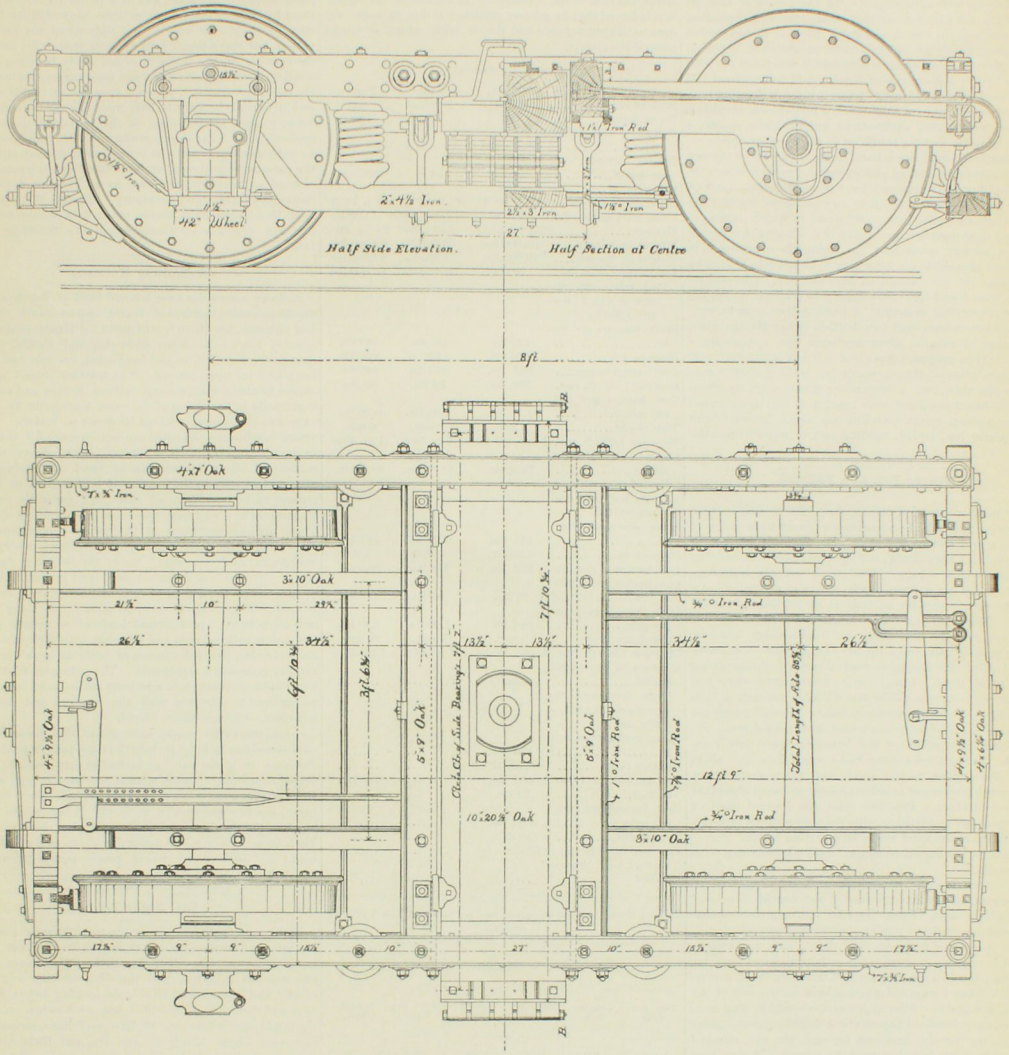
The outside of the car is painted a dark brown, with Eastlake ornamentation. A coat of priming was first applied, then the holes puttied, then three coats of filling, two coats of rough stuff, four coats of finishing color, and one coat of wearing body



Reclining Chair.

varnish. Upon this surface the ornamentation is applied, and then as a finish, two additional coats of body varnish. The roof

STANDARD PASSENGER CAR TRUCK—CHICAGO & ALTON RAILROAD.



has three coats of brown paint and one coat of wearing body varnish; the trucks two coats of brown paint and one of varnish. Hand-rails, truss-rods and other iron work are painted with one coat of black. The inside of car is first filled, then shellaced and ornamented where required, and then varnished. Parts that are to have an oil finish are rubbed down and oiled.

THE annual spruce-gum product of Maine is estimated at $40,000. It is sold chiefly to factory girls as a preventive of lockjaw and paralysis of the tongue from excessive talking.

YOU can't eat enough in a week to last you a year, and you can't advertise on that plan either.

The Origin of the Sleeping Car.

Mr. W. Barnet Le Van, M. E., of Philadelphia, says:

From all accounts, no doubt, Napoleon I. used, in 1815, the first "sleeping, dining-room and parlor car" that ever was built. This car, or chariot, was taken at Waterloo, and was presented to the Prince Regent of England, by whom it was afterward sold to Mr. Bullock for $12,500. It eventually found its way to Madame Tussaud's Wax-work Exhibition, London, where it may still be seen. This very curious and convenient chariot of the First Emperor was built by Symons, of Brussels, for the Russian campaign, and is adapted for the various purposes of a pantry and a kitchen, for it has places for holding and preparing refreshments, which, by the aid of a lamp, could be heated in the carriage. It served also for a bed-room, a dressing-room, an office, etc. The seat is divided into two by a partition about six inches high. The exterior of this ingenious vehicle is of the form and dimensions of our large coaches, except that it has a projection in front of about 2 feet, the right-hand half of which is open to the inside to receive the feet, thus forming a bed, while the left-hand half contained a store of very useful things. Beyond the projection in front, and nearer to the horses, was the seat for the coachman, ingeniously contrived so as to prevent the driver from viewing the interior of the carriage, and yet so placed as to afford those within a clear sight of the horses and of the surrounding country. Beneath this seat is a receptacle for a box, about 2½ feet in length and 4 inches

deep, containing a bedstead of polished steel, which could be fitted up in a couple of minutes. Over the front windows is a roller blind of strong painted canvas, which, when pulled out, excluded rain, while it admitted air. (This might be an advantageous appendage to our present car windows as well as carriages). On the ceiling of the carriage is a network for carrying small traveling requisites. In a recess there was a secretaire, 10 × 18 inches, which contained nearly a hundred articles presented to Napoleon I. by Maria Louise, under whose care it was fitted up with every luxury and convenience that could be imagined. It contained besides the usual requisites for a dressing box, most of which were of solid gold, a magnificent breakfast service, with plates, candlesticks, knives, forks, spoons, a spirit lamp for making breakfast in the carriage, gold case for Napoleon's gold wash-hand basin, a number of essence bottles, perfumes and an almost infinite variety of minute articles, down to pins, needles, thread and silk. Each of these articles were fitted into recesses most ingeniously contrived, and made in the solid wood, in which they were packed close together, and many one within the other, in such a narrow space that, on seeing them arranged, it appeared impossible for them ever to be put into so small a compass. At the bottom of his toilet box, in divided recesses, were found 2,000 gold Napoleons ($7,700); on the top of it were writing materials, a looking-glass, combs, etc., a liquor case which had two bottles, one of Malaga wine, the other of rum; a silver sandwich box, containing a plate, knives, spoons, pepper and salt boxes, mustard pot, decanter, glasses, etc.; a wardrobe, writing desk, maps, telescopes, arms, etc.; a large silver chronometer, by which the watches of the army were regulated; two merino mattresses, a green velvet traveling cap, also a diamond head dress (tiara), hat, sword, uniform and an imperial mantle, etc.

Poking Fun at a Railroad.

On another occasion (says a chronicler of hair-breadth escapes on railroads) I remember we came within an ace of having a very serious accident. The engineer had got off to snow-ball a chip-munk, and the conductor was minding a young widow's baby. The result was, the train happened to get on a down-grade, and was started off at a terrible rate, every bit of four miles an hour, I should think. We were just half a mile above the Annapolis Junction, and the first thing we knew—there being no one to whistle and wake up the switch-tender—we were turned off into the Annapolis road and went down the wrong track at full speed. Imagine our consternation when just at this moment we heard the whistle, not half a mile ahead of us, of the Annapolis up-train. We were paralyzed with terror. Here were two trains on the same track, approaching each other at the headlong speed just mentioned. Evidently our time had come. In a few short hours the engines would meet, and then—destruction. With great presence of mind a minister on board organized a prayer-meeting. Pale but calm, the doomed band of passengers sat, and though with the very shadow of death upon them, raised their voices in a parting hymn.

"Send for the baggage-master," said a young man with a sad smile.

"For what reason?" was asked.

"Because we are about to pass in our checks."

Everybody wept. From the rear platform we could see the miserable engineer straining every nerve to catch up; but he had tight boots on, and didn't gain anything to speak of. At this moment a ray of hope dawned upon us. I had just finished writing my will on the back of a visiting-card, when I observed a young lady in the act of detaching her bustle. Placing the article—which was composed of eight hundred papers and a hair mattress—under her arm, the heroine marched through the car, climbed up on the tender, and then over the engine. It was very interesting to see her climb over the wheels and brass things on her way to the cow-catcher. Holding on by the cross-bars with one hand, the noble maid tied the bustle on the sharp prow with the other.

You can guess the result. In the course of the afternoon the collision came off. Protected by the bustle, the engine received a gentle bump, and we were saved. I took up a collection for the woman on the train. I always take up a collection on such occasions—always. And what's more, I never forget to give the object interested something nice out of it—never. There is nothing mean about me. I suppose you have noticed my clothes.—*Exchange.*

Trial of Mogul and Ten-Wheel Engines.

The East Tennessee, Virginia & Georgia road recently made a trial to prove whether Mogul or ten-wheeled engines were the better pattern for pulling freight over the heavy grades and sharp curves of its track. The trial was made on a hill where the grade for over a mile (5,700 ft.) averaged 69.2 ft. to the mile, the sharpest curve having a radius of 573.7 ft. (a 10° curve) and occurring on the maximum grade of 98 ft. to the mile. The table below gives the names of the builders, dimensions of engines and results of the trial. The same cars were hauled by each engine over the same track, and the same steam gauge (first tested) being used in each instance. In the first trial with 20 cars, the engines were stalled after running the distance named, for want of tractive power. In the second trial with 17 cars, the Mogul after running 4,600 ft. stalled again for the want of tractive power, and the others ran over the grade the full distance of 5,700 ft. The Mogul made a third trial with 16 cars, and pulled them over the grade. As the running gear of the ten-wheeled engine more nearly resembles that of the "American" or eight-wheeled engine, it is believed that its greater efficiency is due in some degree to the greater ease and power with which it works around the curves.

TRIAL OF ENGINES.

	Baldwin.	Baldwin.	Rogers.
Style of engine	Mogul	10-wheel	10-wheel
No. of engine	34	92	82
Cylinders, dimensions of	18 × 24 in.	18 × 24 in.	18 × 24 in.
Driving wheels, diameter of	54 in.	54 in.	55⅝ in.
Flues, No. of	184	171	173
Flues, dimensions of	2″ × 10′ 9″	2″ × 12′ 3″	2″ × 12′ 3″
Flues, total length of	1,978′	2,094′ 9″	2,119′ 3″
Fire-box	33⅛″ × 67⅞″	34″ × 67″	34″ × 66⅛
Weight on drivers	66,000 lbs.	60,000 lbs.	62,100 lbs.
Weight on trucks	12,000 lbs.	22,750 lbs.	24,500 lbs.
Total weight of engine.	78,000	82,750 lbs.	86,600 lbs.
First trial with 20 cars weighing 1,003,900 lbs.			
Steam pressure per sq. in	145 lbs.	141 lbs.	140 lbs.
Distance run	3,394 ft.	3,820 ft.	3,600 ft.
Coal burned in run	357 lbs.	378 lbs.	336 lbs.
Coal per 1,000 ft. run.	105 lbs.	99 lbs.	93 lbs.
Coal burned per ton per mile	1.10 lbs.	1.04 lbs.	0.98 lbs.
Time of run	5 min.	7 min.	6 min.
Time per 1,000 ft. run.	1 min. 28 sec.	1 m. 50 s.	1 m. 40 s.
Curvature where stalled	Tangent.	6° curve.	6° curve.
Second trial with 17 cars weighing 851,700 lbs.			
Steam pressure per sq. in	145 lbs.	145 lbs.	148 lbs.
Distance run	4,600 ft.	5,700	5,700
Coal burned in run	399 lbs.	462 lbs.	650 lbs.
Coal burned per 1,000 ft. run	87 lbs.	81 lbs.	114 lbs.
Coal burned per ton per mile	1.07 lbs.	1.00 lbs.	1.40 lbs.
Time of run	6 min.	7 min.	10 min.
Time per 1,000 ft. run.	1 min. 18 sec.	1 m. 14 s.	1 m. 45 s.
Curvature where stalled	6° curve	.....	.....
Third trial with 16 cars weighing 800,900 lbs.			
Steam pressure per sq. in	150 lbs.	.....	.....
Distance run	5,700 ft.	.....	.....
Coal burned in 1,000 ft. run	462 lbs.	.....	.....
	81 lbs.	.....	.....
Coal burned per ton per mile	1.07 lbs.	.....	.....
Time of run	10 min.	.....	.....
Time per 1,000 ft. run.	1 min. 45 sec.	.....	.....
Curvature where stalled	.....	.....	.....

Table of Grades: Ascent of each in feet per mile and length of each in feet.

Grade.		Grade.		Grade.	
Feet per mile.	Length, feet.	Feet per mile.	Length, feet.	Feet per mile.	Length, feet.
Level.	400	62.8	300	60.7	200
26.4	200	56.0	300	47.5	100
Level.	200	71.3	800	68.8	300
22.2	300	59.6	200	63.4	200
44.3	300	52.2	200	78.1	500
59.6	100	63.9	200	57.5	100
87.1	300	90.8	300	....	..
79.7	100	98.0	100	...	....

Table of Curvature.

Curvature	10°	6°	5°	4°	3°
Lengths of curves in feet	100	1,116	1,300	200	575

Total length of curvature in feet 3,786
Total length of tangents in feet 1,914
Total distance run in feet 5,700

Safety Car.

The many lamentable accidents which have occurred by reason of the inability of passengers and others in railroad cars to extricate themselves, or to be rescued, in cases of collisions, derailing, or other accidents, make it highly desirable that better means than are at present afforded should be furnished to meet this difficulty. The ordinary doors and windows of a car are generally blocked, or are otherwise inaccessible. Mr. Alfred A. Starr, of Westfield, N. J., has patented an improved means of escape in case of such accidents. The invention consists in constructing railroad passenger coaches with trap-doors in their floors within the aisles of the cars, and so arranged that they open inward and toward opposite sides. Each of these doors may be nearly the whole width of the aisle, and of any desired length, and when closed are preferably flush on their upper surfaces with the floor of the car, so as to offer no obstruction to walking in the aisle. It is also desirable to hinge them in close proximity to the seats, so that the hinges shall offer no obstruction.

It is proposed to hinge the doors alternately on the opposite sides of the aisle, and it is preferred not to secure them by bolts or fastenings, so that they will be free to open of their own weight, not only when the car is inverted, but also when it falls upon its side. To facilitate the opening of the doors, they are made beveling downward on their opposite sides, and their corresponding seats are made beveling in a reversed direction, so that if violent end pressure is brought to bear upon the car the seats will act as wedges on the sides of the trap-doors to ease and open them. A car thus constructed with trap-doors that are self-opening, or may be conveniently opened either by the passengers in the car or by others from the outside in case of an accident, combines in an eminent degree the elements of safety and simplicity. Should this improvement be adopted by railroads many lives would be saved that are otherwise needlessly sacrificed.—*Scientific American.*

A Railway Nuisance.

Railway companies have labored hard of late to abolish the disagreeable features of travel, and to insure comfort and pleasure, but there is still room for improvement. In country towns the depot platforms and waiting-rooms, next to the hotel offices and bar-rooms, are the best loafing places for town loafers. The traveler would as soon expect to alight at a country railway station and not find it virtually in possession of the town loafers, as he would expect to find a town without its quota of loafers. These young hoodlums—and some are not young—fill the seats in the waiting-rooms, spew tobacco on the floors, fill the rooms with cheap tobacco smoke, bawl out profane and obscene language in the hearing of ladies, glare at travelers and make comments on them, and generally conduct themselves in a way that would disgrace a drove of hogs. These unclean specimens of the rising generation—born and raised in the pure country air!—infect country railway depots as "river-rats" infect the shipping docks in cities. Town councils have passed laws punishing loafing at depots, and forbidding it, etc., and in some cases they are enforced enough to do some good; but many towns still allow their "professional loafers" to possess depots and annoy railroad men and travelers with their vile habits and behavior, to the detriment of both the town's and the railway company's reputation. The young hoodlums of a town have no business at a railway station, and especially no business to interfere with the comfort and peace of travelers.—*Chicago Hotel World.*

—And the writer might have added that these fellows sometimes buy tickets, go into the cars, put their hoofs on the seats, or, if the seats are locked so they cannot be reversed, brace their knees against the back of the seat in front of them, eat roasted peanuts, whistle their favorite tunes, smoke cigar stumps on the sly in cars where ladies are, and indulge in a variety of skylarking performances. Their trips, however, are generally short, and on this account the patience of decent people is not utterly exhausted.—ED. C. B.

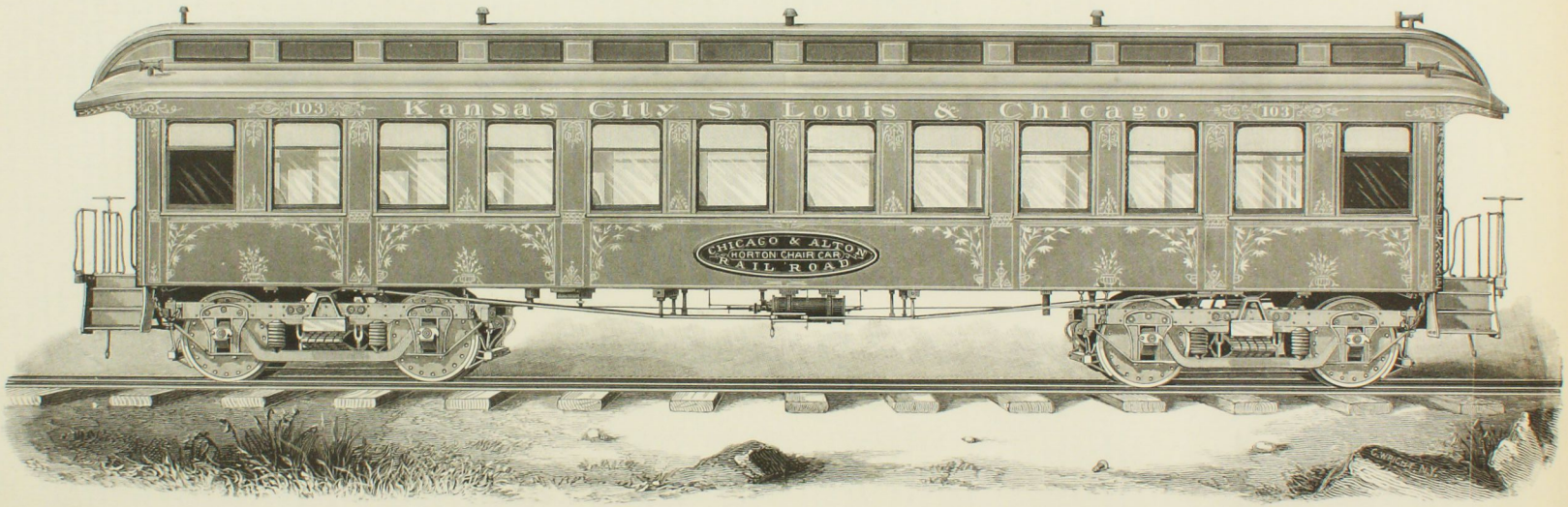
The Night Train.

Night passengers will appreciate the following sketch of the interior of a sleeping-car at daybreak: The car lamps have gone out disgusted, the little wakefulness of the sleepers has subsided, and the dim, snoring outline of cloaks and shawls and frightened-looking heads, flecked here and there like a troubled sea with white, compose the landscape; while over all, like pendulums, swing plethoric carpet-bags slowly to and fro, and little satchels, brisk as mantel clocks, and bonnets, made of nothing, dance up and down like blossoms in a rain, all timed to the motion of the train.

But the dim gray turns to an old-eyed white, and the breathing bundles begin to stir; out of an egg-shaped package is hatched a woman, with locks disheveled, like Venus from the sea. A throe or two, and a rougher form emerges from cloak and shawl and shakes itself awake. A shapeless heap turns out a man, bearded like a pard. A pair of boots, thrust out like bowsprits, goes out of sight as the owner comes in view. One is soothing an irritated hat with gentle touches of his elbow; another pulling at his wilted collar. Disordered tresses are smoothed with hasty touches of the hand, and crumpled sleeves persuaded nto shape. One lady has learned her lesson from Grimalkin, and makes her toilet precisely like a cat.

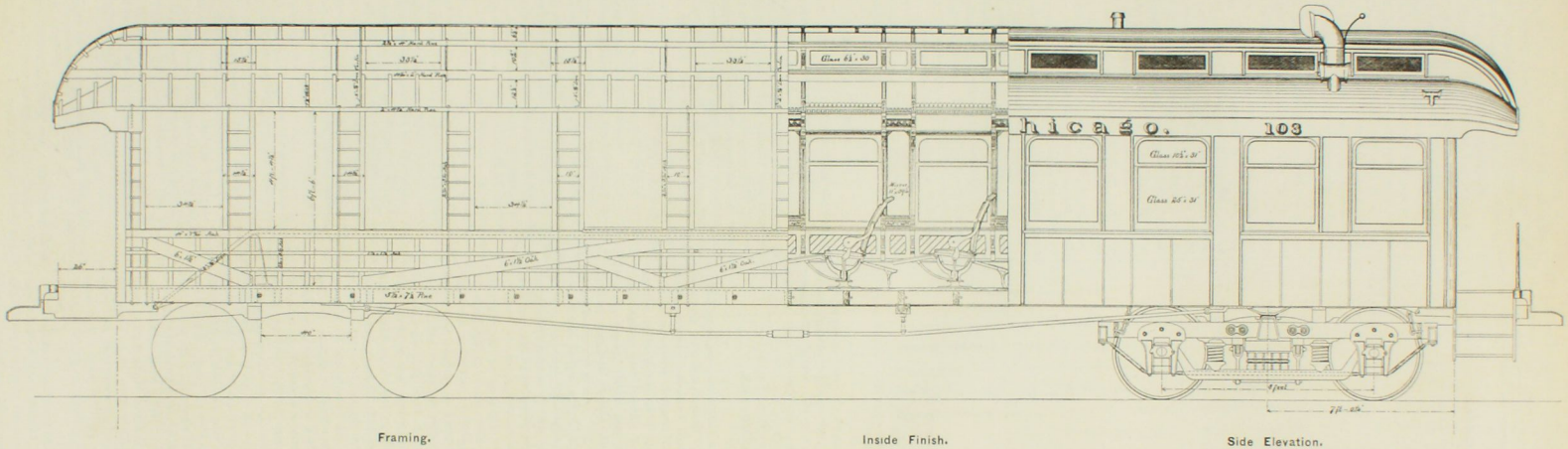
The cold, clear light of early morning is always trying to human beauty; there are no tints to be borrowed, no softening shades to be worn; a plain, cold stare that looks one out of countenance. But in a railroad train the ordeal is appalling. If a face ever looks faded, it is then; if the hair has any gray in it, it is sure to show; wrinkles are read, like a sign-board, afar off. If there be discontent in the heart, it comes into the mouth, and everybody looks like people after a masquerade, or *Richard* after he became "himself again."

A MAN who lost an eye by a railway accident has sued the company and recovered $10,500, and says he can now see his way better in the future than he ever could before.

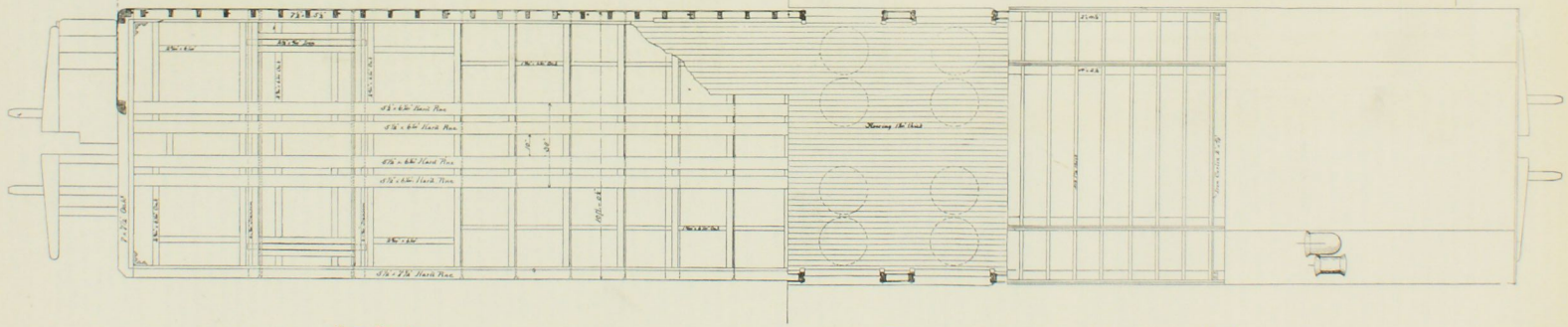


STANDARD PASSENGER CAR—CHICAGO & ALTON RAILROAD.

Built at the Bloomington, Ill., Shops; Wm. Wilson, Superintendent of Machinery.



Framing. Inside Finish. Side Elevation.



Floor Framing. Floor. Roof.

STANDARD PASSENGER CAR–CHICAGO & ALTON RAILROAD.

Work on the Canadian Pacific.

The construction of the Pacific end of the Canadian Pacific Railway, in British Columbia, is beset with natural difficulties of a very formidable character, as appears from the following particulars obtained from the contractor and chief engineer by a reporter of the *Oregonian*:

The work thus far on the Frazer River has resulted in the completion of 23 miles of track, upon which 1,000 men have been at work for 18 months, and the grade from the 60th to the 90th mile is nearly completed. The work from Emory to Thompson's River, a distance of 60 miles, is probably the most difficult and expensive on the North American continent. Frazer River is bordered with steep, rugged mountains of solid granite, from 5,000 to 8,000 ft. high. In the first 17 miles there are 13 tunnels—four in one mile and six in another. In the division above Emory there are no less than 600 trestles and bridges, and in the last 85 miles more than 100 embankments, which at the foundation level are 17 ft. wide, and the cuts 22 ft. The tunnels are 22 ft. wide and 21 ft. high. Over the entire contracts the rock is of the hardest compact granite, in which often occur wide and extremely rich quartz veins. For miles the road is literally hewn out of the sides of the cliffs. The approaches to many of the tunnels are galleries. At the eastern approach is tunnel No. 7. For over 100 ft. the bluff is galleried, and overhangs the roadway 24 ft. in width or 2 ft. outside the road-bed, below which is an almost pendicular precipice of 200 ft. The first tunnel is at the north end of Yale, and the first four happen within a mile and a half of the town. It required 18 months to build the first two miles, working in the tunnel night and day. From one point six tunnels are visible at a glance. The grades and curves are moderate, the heaviest grade being 50 ft. to the mile. The first two miles from Emory cost a trifle over $200,000 per mile, and the 11 miles from the eighteenth to the twenty-ninth cost $175,000 per mile. The average cost per mile of the upper division along the Frazer and Thompson's rivers will be over $75,000. This does not include the cost of rails and fastenings, which are furnished by the government. The cost of the 212 miles from Port Moody to Kamloops Lake will be, exclusive of rails, $12,000,000. The company has erected at Yale nitro-glycerine and powder works, with a capacity of 11,000 pounds per day, and car and machine shops, and all the supply departments.

A Merited Tribute.

The retirement of Mr. John C. Davis from the position of Master of Machinery of the main stem and branches of the Baltimore & Ohio Railroad, was made the occasion of an interesting ceremony at the Mount Clare shops, at Baltimore, on the 3d of May. The officials and employés of the machinery department, as a token of their personal esteem, and regret at his retirement, presented him with a horse and jagger wagon, with equipments complete, and costing altogether $700. Mr. N. E. Chapman, the successor of Mr. Davis, made the presentation speech in the presence of more than 300 of the employés, which was fittingly responded to by Mr. Davis. There were some 800 contributors to the gift, including employés of the company on the line as far west as Chicago.

Mr. Davis entered the service of the company in 1840 as a journeyman machinist in the road department. About four years afterward he entered the machinery department, when he was gradually promoted, until he was made master mechanic. In 1853 he left the service of the company and entered that of the Baltimore & Susquehanna road (now Northern Central) where he remained until 1860. From this time until the outbreak of the war he was in the employ of Mr. Ross Winans, traveling and looking after Mr. Winans' patents. When the war broke out he went on a farm which he owned in Baltimore County, and in the fall of 1862 accepted the position of master of machinery of the eastern division of the Ohio & Mississippi road, with headquarters at St. Louis. He left this service to enter that of the Western Maryland road in the winter of 1863, where he remained until he was again called to the service of the Baltimore & Ohio as master of machinery in 1865, which position he filled until the first of March, 1882, when he was succeeded by Mr. N. E. Chapman, of the Cleveland & Pittsburg road.

THE Atchison, Topeka & Santa Fe shops, at Topeka, have just turned out a complete passenger train, every article of [which, including locomotive, tender, baggage, postal cars and passenger coaches, from the heaviest work to the most elaborate finish, including the very lanterns used by the train hands, and excepting only the paper wheels of the baggage cars, was manufactured entirely at Topeka. The locomotive is named the William R. Strong. It has 18×28 cylinders and 60-inch drivers. The baggage cars, of which 24 were built, cost $3,574 each; the nine postal cars cost $3,741 each, and the passenger coaches $6,200 each.—*Albuquerque Herald.*

THE CAR BUILDER for May has come to hand. This publication is always welcome, even though it is hard on our scissors.—*Elevated Railway Journal.*

Valve-gear and locomotive cabs *are* a little hard on the scissors; but we will give our neighbor's editorial cutlery something to do as soon as we recover our old file of comic almanacks that we lost on moving-day.

Big Locomotives.

We have so frequent inquiries about the size and weight of the largest lococomotives that we give herewith the weight and dimensions of the heaviest freight and passenger engines that we know of that are in use in this country:

	Name of Railroad or Builder.	Kind of Locomotive.	Size of cylinders.	Diameter of driving wheels.	Weight on driving wheels.	Total weight.
Passenger Locomotive.	Reading Railroad	Fast express	21 × 22 in.	68 in.	*64,350 lbs.	90,300 lbs.
	Pennsylvania Railroad	" " Class K	18 × 24 "	78 "	*65,300 "	92,700 "
		Fontaine locomotive	16 × 24 "		†44,000 "	93,000 "
	Baldwin Locomotive Works	Fast express	18 × 24 "	78	†35 to 45,000 lbs.	85,000 "
	Boston & Albany	"	18 × 22 "	66 "	*56,000 lbs.	80,000 "
	Pennsylvania	Tank locomotive	17 × 24 "	62 "		**130,400 "
Freight Locomotives.	Reading Railroad	Consolidation		50 "	88,500 lbs.	102,000 "
	"	Twelve wheels coupled		46 "	101,000 "	101,000 "
	Atchison, Topeka & Santa Fe	Consolidation, tank	20 × 26 "	48 "	‡100,000 "	‡115,000 "
	Central Pacific	Mogul, tank	17 × 24 "	48 "	88,000 "	

* On four wheels. † On two wheels. ‡ Estimated. ** Reported weight.

We have to take a newspaper statement of the last-named passenger locomotive, which is to be used on suburban trains of the Pennsylvania Railroad out of Philadelphia, and is said to weigh 120,400 lbs.—*Railroad Gazette.*

Fine Cabinet Woods.

The growing importance and magnitude of this trade is strikingly manifest from an inspection of the stock kept in the yards and warehouses of dealers in New York. The constantly increasing demand for the finer and more costly articles of furniture, as well as for the more elaborate ornamentation and interior finish of the better class of houses, hotels, public and private offices, steamers and railway cars, has greatly contributed to the activity and extension of the trade.

Every accessible part of the earth is explored in search of new varieties, and not a few of our native woods, not hitherto considered of any value for decorative purposes, have been found to have rare qualities for cabinet work.

One of the most prominent importers of hard and ornamental woods in the city is the well-known firm of George W. Read & Co., whose mills, yards and warerooms occupy the block at the foot of Fifth and Sixth streets, on the East River, and fronting on Lewis street. At this point 95 per cent. of the imported woods are landed, and from which the choicest and most desirable selections can be made. The stock of the concern includes the entire category of fine cabinet woods, native and foreign, in the form of logs, planks and veneers. The most conspicuous among these is their extensive supply of that most beautiful and serviceable of all ornamental woods, mahogany. The logs are cut square in the forest, in order to save weight and space in transportation, and some of them now lying in the yard are 38 inches square and 21 feet long. Besides a heavy stock of logs of various sizes, the display of sawed mahogany planks is no less extensive. These show the quality of the wood in its superior richness and variety of grain and tint, which every connoisseur so well understands, and which age and the finishing processes render doubly beautiful. There are also some remarkably fine specimens of white holly in the log, the largest of which measure 31×30 inches in section. These logs when cut into boards show a very white surface, close grain, and little or no heart to break the uniformity. Our space will not allow us to particularize all the choice woods to be found in the yards and warerooms of this concern, our main object being to direct attention to their stock of mahogany, which in quality and quantity can hardly be excelled.

The veneer department contains a great variety of beautiful burls—French walnut, laurel, butternut, ash, cherry, etc.—the product of the firm's own sawing and cutting. One important specialty consists of oak head-linings and panel stock; some of the oak for linings being 18 inches in width—a very desirable feature for this class of material. Besides the veneer-cutters, the concern has a board-cutting machine, which has been patented by Mr. Read, and for the kind of timber to which it is adapted it is a great improvement upon sawing. The log to be cut is steamed before being placed in the machine, in order to soften the fiber and make it more yielding. Boards of a maximum thickness of $\frac{1}{16}$ of an inch, and 8½ feet in length, are sliced off as fast as two men can remove and stack them up. The knife leaves the face of the boards perfectly smooth, so that no planing is required, the fibers being left as solid and undisturbed as those of a sawn board.

The method of drying the boards cut from the steamed logs by the machine is very effective, the boards being thoroughly dried and pressed by one process, and in a very few minutes. This is done by placing them between heavy iron platens heated with superheated steam and worked in three sets of presses by hydraulic pressure; the moisture from the boards being forced out through intermediate perforated plates in the form of vapor. By this press-drying process, a luster-finish is imparted to the boards, while they are at the same time seasoned so as not to be liable to warp or shrink. The thicker lumber is dried by being stacked in the usual way so as to expose the surfaces to the air.

The firm has recently erected a large and commodious warehouse and factory on Lewis street, and adjoining the public yards where the cargoes of foreign lumber are landed and stored. It is estimated that about nineteen-twentieths of all that is imported comes to these yards.

Recent Reports of Railway Rolling Stock.

Lake Shore & Michigan Southern.—532 engines; 100 passenger, 33 second-class and smoking, 10 smoking and baggage, 21 emigrant, 29 postal, 10 baggage and mail and 55 baggage cars; 8,869 box, 1,717 stock, 291 oil, 2,061 platform, 2,409 coal and 257 caboose cars; 2 pay cars; 10 derrick and 144 ballast cars; total cars, 15,918.

Atchison, Topeka & Santa Fe.—251 engines; 89 passenger, 2 chair, 18 Pullman, 25 emigrant sleeping and 60 baggage, mail and express cars; 3,939 box, 717 combination, 801 stock, 917 flat, 2,300 coal and 113 caboose cars; 2 officers' cars, 2 pay cars and 10 service cars; total cars, 8,915. Additions during 1881 were 94 engines, 92 passenger-train cars, 3,587 freight cars and 5 service cars.

Pittsburg, Cincinnati & St. Louis.—107 engines; 50 passenger, 28 baggage, mail and express, 4,454 freight, and 7 service cars; total cars, 4,539. *Cin. & Musk. Val.*—14 engines; 12 passenger, 4 baggage, mail and express, and 363 freight cars. *Little Miami.*—47 engines; 35 passenger, 18 baggage, mail and express, and 687 freight cars. *Col., Chi. & Ind.*—163 engines; 59 passenger, 31 baggage, mail and express, and 1,676 freight cars.

Chicago, St Paul, Minnesota & Omaha.—125 engines; 52 passenger, 3 sleeping, 3 mail and 29 baggage cars; 2,386 box, 60 stock, 965 flat and 73 caboose cars; 1 officers' car, 1 pay car and 10 service cars; total cars, 3,565. Additional orders are being filled for 25 engines, 7 passenger, and 550 freight cars.

New York, Susquehanna & Western.—17 engines; 15 passenger, 6 combination and 3 baggage, mail and express cars; 11 milk, 2 produce, 5 hay, 32 box, 1 stock, 21 lime, 69 gondola, 47 flat, 55 ore and 5 caboose cars; 10 gravel, 1 derrick, 1 tool and 1 flanger car; 1 steam shovel; total cars, 287.

Michigan Central.—254 engines; 84 first-class passenger, 26 second-class passenger, 3 dining, 14 combination, 6 postal and 33 baggage and mail cars; 4,523 box, 486 stock, 1,431 platform and coal and 155 caboose cars; 1 pay car, 2 inspection cars, 5 derrick cars and 1 piledriver; total cars, 6,757.

Chicago, Milwaukee & St. Paul.—527 engines; 207 passenger, 27 sleeping, 6 parlor and 135 baggage, postal, mail and express cars; 11,036 box (including caboose) cars, 1,419 stock cars, 4,285 flat and coal cars, 32 wrecking and tool cars; total cars, 17,134.

Little Rock & Fort Smith.—12 engines; 11 passenger, 3 baggage, 158 box, 20 stock, 163 flat and 7 caboose cars; total cars, 362.

Railway Master Mechanics' Association.

TO THE EDITOR OF THE NATIONAL CAR-BUILDER:

Having received numerous inquiries as to the time of holding the next annual meeting of the American Railway Master Mechanics' Association, will you please publish the following for the benefit of those interested?

At the fourteenth annual meeting, held in Providence, June 14, 15 and 16, 1881, the following amendment to the constitution was introduced by Mr. Wilder: "Resolved, that Section 1 of Article V. of the constitution be amended so as to read, 'The regular meetings of the Association shall be held annually upon the third Tuesday in June,' which was unanimously adopted."

The General Supervisory Committee would therefore respectfully call the attention of members to this change, and urge that they endeavor to make arrangements to attend this meeting, and those master mechanics not heretofore connected with the organization are especially invited to be present and participate in the proceedings.

The subjects to be brought forward this year are varied and interesting, and the committees are composed of the foremost men of the machinery departments of our railways, and able reports may be looked for. Papers are also expected from eminent professors and scientists of the Association. The meeting this year will be held at Niagara Falls, at the International Hotel, where special arrangements have been made for members and their families.

By order of the Committee. J. H. SETCHEL,
CINCINNATI, April 25, 1882. Secretary.

NATIONAL CAR BUILDER

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JAMES GILLET, *Editor.*
L. E. WATERMAN, CORRESPONDING EDITOR.

MAY, 1882.

CONTENTS.

EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*
A. WILLIAMS & CO., 283 *Washington St., Boston, Mass.*
L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*
WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*
ROBERT CLARKE & CO., 65 *West Fourth Street, Cincinnati, Ohio.*

READERS AND CORRESPONDENTS are requested to bear in mind that the address of the CAR-BUILDER is "*Morse Building, New York, N. Y.*"

Association Meetings.

The *Master Car-Builders' Association* will begin its sixteenth annual convention in Philadelphia, on Tuesday, June 13. The Committee of Arrangements have selected the Continental Hotel as the headquarters of the Association during the meeting.

The *American Railway Master Mechanics' Association* will hold its fifteenth annual convention at the International Hotel, Niagara Falls, beginning on Tuesday, June 20.

The following report in reference to the joint meetings of the two associations has been issued by the committee on that subject appointed at the last meeting of the Master Mechanics' Association:

To the American Railway Master Mechanics' Association:

Your Committee appointed to confer with a committee appointed from the Master Car-Builders' Association for discussion of the desirability of holding joint meetings of the two Associations, beg leave to report that the Joint Committee considered it desirable for the interests of the two societies to have their meetings held upon the same days and in the same place, and to that end recommend that a committee of three be appointed at the next annual meetings of each of the two associations with authority to decide upon a place of meeting for the year 1883. And we would also recommend that said committee designate one of the following cities as the place for the meetings for the year 1883: Saratoga, Niagara Falls, Indianapolis, Pittsburgh or Chicago.

We also recommend that the second Tuesday in June be the time set for holding said meeting.

F. M. WILDER.
JAMES SEDGLEY,
WM. WOODCOCK,
Committee.

THE PROPOSED REORGANIZATION OF THE MASTER CAR-BUILDERS' ASSOCIATION.

At the last two meetings of the association a good deal of time was occupied in discussing the expediency of making some change in its organization with the view of "increasing its efficiency." Last year a definite proposition was introduced in the form of an amendment to the constitution of the association, providing for the admission of a new class of members, who are to represent their respective roads upon written authority to do so from some one of the general officers and who are to vote on the basis of the number of cars owned by such roads, in all matters relating to standards of construction or the expenditure of money. No decisive action was taken upon the proposition, a majority of the convention preferring to let it lie over until this year, so the members could have ample time to think it over and be better prepared to vote intelligently upon the question of its adoption at the annual meeting to be held this month. It is reasonable to suppose that the views of members are by this time pretty well settled as regards the proposition in the shape in which it was presented; and what we may here say about it will not, therefore, be likely to have much influence on the result.

The whole object of the movement is, in current phrase, to "increase the efficiency of the association," by establishing more intimate relations between it and the railroad companies, and so induce these companies to adopt methods of construction that the association may recommend with a view to greater uniformity in the parts and attachments of freight cars; or, in other words, to make the association a *power*, by relieving it of its helplessness when it meets year after year to fire off reports and recommendations and talk and vote in the air. The vital question is, Will the proposed change in its organization bring this about? We are very much inclined to doubt it. Yet we hope, nevertheless, that the change will be made without further delay, just to see how it will work. It can hardly make the association any less efficient than it has been, and it may make it more so. Nor is there any danger that its identity will be destroyed so long as a practical knowledge of car construction is a condition upon which representative members are admitted. So long as the membership is made up of car-builders, it will be a car-builders' association, and not an association of master mechanics, or mechanical engineers, or "railroad men and others," as the monthly meetings were called a few years ago. Very soon after the association was organized, a standing invitation was given to the general officers of railroads—managers, superintendents and others—to take part in the annual conventions and assist with their presence, counsel and advice; but in spite of earnest and repeated solicitation, these gentlemen have been so blind, apparently, to their own interests, and the interest of the properties under their control, that they have persistently kept away and left the association to get along as best it could. The proposed admission of a new class of members is virtually a renewal of this invitation, by asking these officers (if they will not come themselves), to send duly commissioned representatives, who, as an additional inducement, shall have an extra vote upon certain questions for every thousand cars owned by their respective roads.

Now, it may be worth while to look a little more closely into the nature of this new representative element which is to be incorporated into the membership of the association. If it is to be really what its name imports, if the persons who are to come with their letters of appointment are to be representatives in the same sense that members of Congress and of State legislatures are, then we should have no misgivings about it. But are they to be such in fact, or only in theory? Are their representative functions to be practically different from those of the present members of the organization? Are the road companies, as principals, to be bound by the acts of their agents so as to carry into effect the recommendations that may be made by the collective body of which such agents are members, and who have the privilege of casting an additional vote for every thousand cars owned by their principals? If they are not so bound, if compliance with such recommendations is to be merely optional, then the whole proceeding is little better than child's play. Congressional and legislative enactments are *laws* that are binding on the entire constituency, and can be enforced by the civil authority, assisted by military force if necessary. If they were not so, legislation would be little better than a farce; but not more so than the doings of the Car-Builders' Association under the proposed representative scheme, if there is to be no binding obligation on the part of the roads to do what is recommended. Just here is where the whole thing hinges. The association, when reorganized as proposed, will be just as powerless to enforce its decrees as it is now, no matter to what extent it may be composed of representative members armed with letters of appointment. Each and every road has an unqualified right to interpose its veto, and such veto cannot be overridden

It may be asked whether the members voting on the car basis are to vote according to their private judgment, or in obedience to instructions from their principals, which may be in opposition to their private, and perhaps better, judgment. If some particular appliance, pattern or dimension, is agreed upon as a standard, will the representative arrangement hasten its adoption *as* a standard, or will it have to be adopted on its merits if adopted at all, each manager or superintendent judging for himself precisely the same as if there were no such arrangement? There are many considerations that will tend to prevent united action on the part of individual roads in the matter of standards. Car-building, like every other branch of mechanical construction, is progressive, and it is practically impossible to fix upon standards, this year or next, that will not have to be modified or give place to something better within ten or twenty years.

As we have already said, we hope the proposed amendment to the constitution of the association will be adopted without any material modification. We do not think it will revolutionize the association, nor do we fear that two or three big roads will jump at the chance to vote on their heavy car equipment, stockholder fashion, and in that way capture and control the association. Any such scheme would be likely to defeat itself. If the result shall be the access of any considerable number of good practical car-builders to the present membership, it will most certainly increase the influence and usefulness of the association, and tend to bring about a more speedy adoption of its recommendations, so far as they are worthy of being adopted. The relations of individual roads and of systems of roads with one another create a kind of mutual dependence, like that between the links of a chain, so that none can afford to be very much different from the rest in the style and patterns of interchange cars.

As the car departments of the roads, in the matter of construction, are distinct from the other mechanical departments, we believe that the Car-Builders' Association should remain a distinct organization, by preserving intact its proper identity. Managers and superintendents are, from the nature of their duties, another element altogether, which can not be assimilated with its membership, no matter how wide or invitingly the doors of the association are thrown open for their reception. Car-builders, as such, have a field of their own, and can plow it better than anybody else can plow it for them. Nor should disparaging reflections be cast upon them for not being proficients and experts in other departments of scientific and technical knowledge beyond their sphere. To be able to construct a good railway car does not necessarily imply a like capacity to build locomotives, bridges and viaducts. As well might a competent and successful ship-master be expected to calculate eclipses or determine the perturbations of planetary motion.

ABUSES IN LIVE STOCK TRANSPORTATION.

A recent article in the New York *Tribune* contains a recital, from personal observation, of the abuses practiced in the transportation of live stock from Chicago to New York, which it is absolutely sickening to read. It is possible that the statements may be exaggerated in the interest of the inventors of prize cattle cars, but there is reason to fear that they are not. To reprint them in our columns might excite a little wider commiseration for the sufferings of the wretched brutes, and a trifle more of condemnation for their tormentors and a public sentiment which allows a United States statute, designed to prevent such cruelty, to remain a dead letter. Cattle trains, it is said, are frequently 50 hours between Chicago and Buffalo, during which time the animals are without hay or water; and 110 hours between St. Louis and New York, with only 3½ hours for feeding and rest, much of this time being taken up with unloading and reloading. It is said to be a general practice, upheld by shippers and dealers, to give salt to the animals and deprive them of water for many hours before reaching their destination in order to increase the intensity of their thirst, and then to let them drink all they can just before being weighed; and that when slaughtered the next morning, great clots of blood, caused by the merciless prodding they have received, are found under their hides on the neck, head and rump, and that these evidences of barbarity are carefully cut away by the butchers so as not to injure the sale of the meat.

Some idea can be formed of the extent to which these practices are carried, from the fact that 1,500,000 head of cattle were received at Chicago from the Western plains in 1881, and that about two-thirds of this number were shipped to the Eastern markets, not including, of course, sheep, hogs and horses, the aggregate number of which was much larger. It seems like a grim jest to talk of "prize" and "palace" stock cars, with separate stalls, plenty of room for lying down, unlimited water and feed, and that the animals at the end of a thousand mile trip in these cars are turned out in better condition than when they started. The rapacity of shippers and transporters in the saving of freight and time can not be checked by any sentimental solicitude for the comfort of the cattle, whether exhibited by the American Humane Association, or by needy inventors and patentees eager to dispose of their wares. The kind of car best adapted to the wants of the trade from their point of view is the one that will hold and carry the greatest weight of Texas steers to the cubic inch of inside space. So long as freight competition is as active as it is now, it stands to reason that one road is not going to carry cattle as loosely packed as are the bears and hyenas in Barnum's show-cars, while another and rival road, by the prodding, screw-pressing, tail-twisting mode of compression, carries twice the weight in trains half as ong. The trouble is not that suitable cars can not be con-

structed. There are plenty of them now and always have been. No extra mechanical skill is required to design them; and this is the reason why there were so many competitors for the $5,000 prize offered two years ago; the designs being so good and so numerous that the judges were unable to decide which was the best. The fact is that the shippers and transportation lines don't want any new-fangled stock cars, weighted down with patent royalties, unless they will carry more cattle in less space than the present cars will, and so enhance the profits of the business.

What is needed to put a stop to this barbarous treatment of live stock—this growing abuse which is a reproach to civilization—is the rigid enforcement of the existing law of Congress, providing that cattle shall not be confined in cars while in transit more than 28 consecutive hours without food, water and rest; and also a strict legal supervision over the management of cattle trains.

SLEEPING, DRAWING-ROOM AND HOTEL CARS.

Railroading may well be called a science, and that it is an advancing science is forcibly illustrated by the increase from year to year in the number of parlor, sleeping and hotel cars. The two first-named classes have become so common as to be an indispensable part of the equipment of every road that has even a moderate amount of through and local passenger traffic. Twenty years ago, when the so-called palace cars were first brought out, they were looked upon as a novelty which none but very opulent and stylish people could afford to patronize. The disparity in weight as between cars and passengers was fearfully suggestive of expense and the necessity of high fares in order to make the thing pay. People who could afford to travel in this exclusive way wanted to travel fast as well as luxuriously. Speed must not be sacrificed to comfort. This suggested track-wear, the brooming and breaking of rails and frequent renewals, all contributing to augment the cost. But this is now an old story. Steel rails, better roadbeds, improved construction of running gear and more capable management, have not only made it profitable to the companies and to the community to run such cars, but their weight and dimensions have also been increased almost in the ratio of their numbers. Not the least of the advantages that have accrued from them is the great saving of time by night travel and the running of the same cars a thousand miles, more or less, continuously, without transferring their occupants to other cars.

Surely this is something to be achieved from so small a beginning. And when we have along with it all the marvels of cabinet work and upholstery, mirrors, carpets, light, warmth, ventilation, toilet rooms, beds, and a host of minor conveniences there would seem to be small room for cavil and fault-finding. Yet man is a kind of animal whose wants appear to multiply the more they are gratified. It matters not that he can travel all night at a high rate of speed, stretched out at full length in an upper berth and on a mattress softer than he has at home. This upper berth is found to be too contracted. He wants a whole section, and even then he doesn't find it pleasant. There are too many people in the car for the space, and this makes the air close. It is midsummer; the weather is hot, very hot, and the car is as hot as the weather, when it ought to be cooler. What's the use in finery if one can't be comfortable? Some of the drawing-room cars in summer are frequently hotter and closer than emigrant cars. The openings in the monitor roof are too small. The large windows in some of the best of them, for some inexplicable reason, can only be raised a few inches, and they are so provokingly adjusted that when open the lower part of the frame is just on a level with the eye and obstructs the view. This is almost maddening to one who wants to enjoy the landscape as a whole without having it divided in the middle by a mahogany stick. And then, in spite of the lounge cushions, there is a perceptible jar in the motion of the car, which, from frequent repetition, induces fatigue and restlessness. This is probably owing to poorly tempered springs in the trucks or a lack of resilience in the metal, or perhaps the mechanic has inadvertently put them in wrong side up. Electrical lighting should be introduced at the earliest practicable moment into the better class of cars, and especially "sleepers," in which the lights are frequently so dim and dreary in the early part of the evening as to drive people to bed before their usual hour, and, indeed, directly after supper. Every child knows how exasperating this is, and it can scarcely be less so with adults.

The principal feature in the drawing-room car is the chairs. They should not only be inviting to look at, but to the sitter they should be Elysium itself. This, however, is far from being the case. The backs are in many cases too low to support the sitter's head, and when they are sufficiently high for that purpose, there is no tidy provided to keep the brilliant plush from getting soiled—an oversight which in an ordinary housewife would be unpardonable. The spring seats are comfortable enough when they are new and in good order; but there is a kind of antagonism between the bulging, convex form of the seat and the contour of that part of the human anatomy which comes in contact with it, which "too-too" people might object to. The trouble with spring seats is that they are either too rigid for light weight people, or too soft and yielding for those who weigh 200 pounds and upwards. For our own part, we would prefer a cane-seat of good width, slightly concave, but not enough so as to form a kind of pocket which would require an effort on the part of the sitter to get out of when once in it, and on this seat we would lay a leather or plush cushion that would conform to the concavity of the cane. These cushions could easily be made over whenever they became hard or foul from usage. Other defects, real or imaginary, in our palace car system, might be enumerated. But, after all, what is the use? There are spots on the sun, and always will be so far as we know; but they are invisible unless they are carefully sought after with the aid of a glass.

A more recent development of the system is exhibited in the hotel and dining car. These cars are not identical, as some might suppose; a hotel car being provided with both sleeping and eating accommodations for passengers who occupy it during a trip; while a dining car is more properly a restaurant attached to a train for the convenience of all the passengers in the other cars of the same train. The more these cars are brought into use, the dining cars especially, the more popular will they become. They will be found a very great convenience in long trips. The traveler who leaves the luxuries of home or of city hotel life, will in this way be sure of decent fare and good attention without being compelled to regale himself on fried beefsteaks, muddy coffee and other staple "refreshments" that are served up in new settlements on the frontiers of civilization. These cars have for some time been a feature of through passenger trains on some of the leading Western roads, and the Pennsylvania Railroad Company has just placed on its line a number of very commodious dining cars to be run with the New York and Chicago Limited Express. All things considered, it is pretty evident that the dead-weight bugbear which excited the fears of so many people a few years ago, was a needless alarm, as regards the general use of the classes of cars to which we have referred.

THE CAR-BUILDERS' ASSOCIATION AND PATENTED DEVICES.

If a patent medicine is efficacious in curing or in checking the progress of a painful malady—and some of them really are so—the sufferer from such malady is not apt to concern himself much about the patent, or the profits accruing to the inventor from the sale of the nostrum. The price for which it can be had, and the amount of good it will do him, are the only essential things to be considered by the user. This would seem to be a fair illustration of the attitude of the Car-Builders' Association with respect to patented appliances designed for the improvement of railway cars. In years past, the impression has prevailed among the members of the association that such devices were not only inadmissible as legitimate topics for discussion, but that committees in making their reports must not indorse or recommend them, no matter what may be their actual merits. The bare suggestion that a thing was patented operated like a wet blanket, limiting the association in the unreserved expression of its views, to old devices that had been long in use or were getting out of date, or those upon which the patents were about to expire. Any new and valuable thing covered with a patent was handled as circumspectly as if it were some infernal machine charged with dynamite. We are glad to see that members are every year getting the better of this peculiar sensitiveness. The very existence of the association implies that car construction is not all that it should be; and that in order to make it so, alleged improvements must be examined, and approved or disapproved on their merits. Who, we would ask, are more competent to do this than car-builders themselves?

It has been customary to speak of the approval of any device by the association as being equivalent to its *adoption*. The frequent use of the latter term is misleading, and tends to convey a wrong impression. The association, as such, can not "adopt" an axle or a brake in the sense of using it. It can adopt rules and by-laws; but axles, brakes and other appliances of a particular kind can only be adopted by the *roads* in so far as they are used in the construction and running of cars. And as the general officers of the railroad companies must determine what are to be used, they must also determine whether they can afford to pay the cost of the article. If it is patented, and if the patent is valid, the royalty is as much a part of the cost as are the materials and labor expended in its manufacture. Its adoption is a business transaction in which buyer and seller make the best terms they can for their respective interests. The amount of royalty charged would, as in other transactions, be regulated in most cases according to the extent of the sale, a large road paying less and a small road more, on the principle of wholesale and retail. The best device ever patented is good for nothing to the vender unless he can sell it, and he would be a fool to take less than the price it will command in the market. And furthermore, no fair minded railroad officer expects to make use of a valuable invention by paying for it only the bare cost of its construction or manufacture.

It is difficult to see what the Car-Builders' Association has to do, strictly speaking, with royalties, or why, in discussing the mechanical merits of alleged improvements, the distinction between patent royalties and other elements of cost should be recognized as of such particular importance. It is the business of the association to determine which improvements, some being good, some worthless, some neither the one nor the other, and all or nearly all patented, are the best with a view to economy, safety and general utility. The rest may safely be left to the managing departments of the roads. If the patentees get the best of it, so much the worse for the management, and so much the better for the patentees, and vice versa.

A TANTALIZING ANNOUNCEMENT.

A paragraph appeared in the Chicago *Inter-Ocean* a short time ago, announcing the discovery of an advanced step in railroad science, which was so radical and revolutionary in its nature as to be fifty years ahead of the age. No hint is given of what it is; but it is said that the officials of no less than six of the longest and most enterprising roads of the Mississippi valley have been discussing the improvement for two days.

Discoveries of this kind have been rather frequent within the past few years, yet in spite of them all railroad operations go jogging along in very much the same old way. Keely's discovery is old and well nigh forgotton; the "atomized" fuel obtained from petroleum and coal tar, which was to run 300 blast furnaces in Pittsburg, and reduce the cost of iron and steel one half, is also lost sight of; grain continues to be transported in the ordinary way, just as if the "twin-cylinder" car had never been thought of; and the new-fangled locomotives appear to have all come to grief. The Fontaine machine made a good fight, but it seems to have succumbed to the old hunker engineers who won't allow any thing to succeed in opposition to the formulas contained in the text books. The "hydro-carbon" locomotive, generating and burning hydrogen gas from water, made an excellent start last September—in the columns of a Chicago daily newspaper—but the formal "opening" on the road between New York and Chicago has for some reason been deferred. Possibly it is this machine that is so mysteriously referred to by the *Inter-Ocean*, or it may be something entirely new, and only waiting to be thoroughly patented before being let loose. The suspense, meanwhile, which every body is compelled to endure, is aggravating, or would be if former announcements of a similar kind had been a little less sensational.

THE resolution which was adopted last year by the Car-Builders' Association, requiring that reports of committees to be made at this year's meeting shall be sent to the Secretary in time to be printed and distributed among the members on the first day of the convention, was a much-needed reform, and should have been thought of and carried into effect years ago. The sessions of the convention do not usually continue longer than three days, and some portion of this time must necessarily be devoted to sight-seeing, sociability and the acceptance of proffered hospitality, leaving none too much for attending to the regular business. The formal reading of committee reports from manuscript is a waste of time, and in some instances a positive bore, especially if the reports are long and largely made up of detailed statistical matter which cannot be fully comprehended, much less digested, from the mere reading. But with printed copies that can be conned over at their leisure, the members will be much better prepared to talk and act intelligently upon the subjects involved than if there is but one copy extant, and that one in manuscript, and not very accessible at that. The resolution, as it was passed last year, refers only to "the next annual meeting." It should be readopted and made to apply to all future meetings, or else be made a part of the constitution of the association.

MR. JOHN ORTTON, General Master Car-Builder, and formerly Mechanical Superintendent of the Canada Southern Railway, has accepted the position of General Manager of the Portage, Westbourne & Northwestern Railway, with headquarters at Portage La Prairie, Manitoba. The road is now under construction, and when completed will be about 500 miles in length, and form an important connection of the Canadian Pacific. Mr. Ortton has been connected with the Canada Southern road for the past six years, and is a prominent member of the Master Mechanics' and Car-Builders' associations. It is to be hoped that the sphere of his new duties, geographically, is not so remote as to prevent his being present at the annual conventions, where his popular personal qualities and ability as a railway mechanic have hitherto been so warmly appreciated.

THE annual convention of the Railway Master Mechanics' Association will be held at the International Hotel, Niagara Falls, commencing on Tuesday, June 20. Attention is called to the communication of the Secretary of the association, Mr. J. H. Setchel, printed in another column, stating that the regular meetings will hereafter be held on the third Tuesday in June, in accordance with an amendment to that effect made to the constitution of the association at last year's meeting. The subjects to be considered this year are varied and interesting, and able

reports are expected from the committees. It is to be hoped that the usual attendance will this year be reinforced by master mechanics who have not hitherto been connected with the organization, and who are specially invited to be present and take part in the proceedings.

Engineering News, one of the best conducted and most successful journals of its class, has changed its name to *Engineering News and American Contract Journal*, as indicating more correctly the scope of the publication, its aim being to cater to the business wants of both engineering and contracting interests, while contributing at the same time to the intellectual cravings of its readers for the "mysteries of calculus" and other recreations of a kindred nature. The great number of people who are directly or indirectly interested in contract lettings will find the *News* an excellent source of informa tion.

THE new shops of the Chesapeake & Ohio road at Huntington, W. Va., are the largest and best on the road. They have been recently enlarged by the addition of an extension to the machine shop and a new blacksmith shop, the old one being taken for a boiler shop. The new shop has 28 forges and a furnace, and they have just put in a new steam hammer and two frame forges. This shop is exceedingly well ventilated by means of slat ventilators in the clear-story of the roof, which can be regulated by rods from below. The fires are placed in pairs and supplied with water tuyeres connected by pipes with the reservoir in the upper story at one end. One set of pipes carries the cold water to the tuyeres and another carries the hot water up to open troughs, in which it cools as it is conducted back to the reservoir. It is the best arrangement of the kind the writer has seen. The oil tank used for tempering springs is inclosed so that all odor from it is carried up through the roof of the shop by a large pipe. The machine shop has a traveling crane over a 72-in. driving-wheel lathe, with which one man can handle a pair of drivers. To the 150-ton hydraulic wheel-press, built by Bement & Sons, Mr. Chapman has added a convenient attachment for testing the trueness of car wheels. After the wheels are pressed on, a center-pin is placed in the center of the plunger and another in the back-head, on which the wheels are revolved and tested before they are rolled out of the press. This press is set in a pit so arranged that when the loose floor, which is on a level with the shop floor, is in place, the press is just right to put on car wheels. When drivers are to be pressed on, which is only occasionally, the loose floor is taken up and the drivers are rolled down an incline. There is a special chuck for turning piston rings, and Mr. Chapman is making another special tool for turning wrist-pins of cross-heads upon an ordinary lathe. Another of his convenient devices is a tallow stand for the head of the boilers, which is hollow, and fills with steam that keeps the tallow can hot. There are four engines in the shop for general repairs and seven to be rebuilt. The car shops have just finished six 4-wheeled caboooses 16 ft. long, and are very busy with repairs and rebuilding; 340 men are employed in both departments.

THE firm of Thayer, Dunham & Ross, manufacturers agents and dealers in railway supplies, Boston, Mass., has been dissolved, and the business will hereafter be carried on under the name of Thayer, Ross & Co.

THE Niles Tool Works, of Hamilton, Ohio, have established a branch office and warerooms in the new Ellison Building, 22 South Sixth street, Philadelphia, at which place some of their own machinery, as well as the products of several other prominent builders, will be kept on hand.

THE Wapakoneta Automatic Car Coupling is very favorably spoken of by railroad men who have given attention to its working. It operates with a hook-link and rock-shaft, the former being made of malleable iron and the latter of cast steel. It is said to be positively automatic and to meet every practical requirement.

GENET & SILVER, dealers in hard-wood lumber, is the name of a new firm recently started in New York. Their stock includes most of the woods used for the inside finishing of cars. The senior partner has heretofore been connected with Ogden & Co., hard-wood dealers, of this city, and Mr. Silver has for many years represented the National Car Spring Company, of which he is now Secretary.

THE New Orleans *Picayune* says that riches and religion are not incompatible; only a man don't want too much religion in the way while he is getting riches.

THE following important decision has been rendered by a writer in one of the technical journals: "If an expert pronounces a boiler to be safe, and it soon after explodes, the expert's opinion shares the fate of the boiler." Sound.

"WHAT did you say the conductor's name is?" "Glass—Mr. Glass." "Oh, no!" "But it is!" "Impossible—it can't be!" "And why not, pray?" "Because, sir, Glass is a non-conductor!" Deafening applause from the scientific passengers.

"I never pretend to know a thing which I do not know," remarked Brown. "When I don't know a thing I say at once, 'I don't know.'" "A very proper course," said Fogg; "but how monotonous your conversation must be!"—*Boston Transcript.*

THE biggest fort in the world is Gibraltar; the biggest ship is the Great Eastern; the biggest cataract is Niagara; the biggest suspension bridge is the one across East River; the biggest diamond is the Portuguese "Braganza;" the biggest wall is the Chinese; the biggest elephant is Jumbo; the biggest showman is Barnum; the biggest failure is the Washington monument, and the biggest humbug is Keely.

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

Canada Southern.—John Ortton has resigned the position of General Master Car-Builder, to become General Manager and Superintendent of Construction of the Portage, Westbourne & Northwestern Railway, in Manitoba.

Central Pacific.—A. N. Towne, heretofore General Superintendent, has been made General Manager; J. A. Fillmore is General Superintendent; J. B. Wright is Superintendent of Sacramento & Oregon Divisions, in place of R. H. Pratt, appointed Assistant General Superintendent,

Chicago, Burlington & Quincy.—S. E. Crance is appointed Assistant Superintendent in charge of the St. Louis Division, with office at Beardstown, Ill. He succeeds W. R. Crumpton, resigned.

Chicago, Milwaukee & St. Paul.—J. T. Clark, late of Union Pacific, has been appointed General Superintendent; and Henry Watkeys, late of New York Central, is Master Mechanic of the West Milwaukee shops.

Chicago & Alton.—W. F. Merrill is appointed General Superintendent. The duties of that office have been for some time past performed by Assistant General Manager Chappell, who is now Acting General Manager.

Chicago & West Michigan.—C. Harris is General Superintendent, with office at Muskegon, Mich.; and L. E. Hitchcock is Master Mechanic at same place.

Cumberland Valley.—O. N. Lull has resigned as Chief Engineer and Purchasing Agent. Purchases will in future be made by the Superintendent or President.

Connotton Valley.—W. W. Hungerford has been chosen General Manager. He was formerly General Superintendent of the Ogdensburg & Lake Champlain road, and more recently of the Texas-Mexic an road.

Detroit, Grand Haven & Milwaukee.—Mr. G. R. Nash has been appointed Assistant Manager in place of John Burton, transferred to the Great Western Railway.

East Tennessee, Virginia & Georgia.—Mr. J. F. Mallory has been appointed Superintendent of the Macon & Brunswick Division, in place of J. M. Edwards, resigned. Mr. Mallory was formerly Superintendent of the Westetn Division of the Chesapeake & Ohio road.

Housatonic.—L. B. Stillson has resigned the position of Superintendent. He has been connnected with the road in various capacities for many years.

Indiana, Illinois & Iowa.—T. P. Shonts is appointed Superintendent, with office at Dwight, Ill.

Lake Erie & Western.—J. B. Clark has resigned his position as Superintendent of Western Division.

Louisville, New Albany & Chicago.—H. O. Nourse has been appointed Purchasing Agent, vice W. M. Lewis, who will continue to perform the duties of Paymaster.

New York & New England.—T. W. Kennan is appointed Superintendent of the Eastern, Western & Springfield Divisions, including the Woonsocket, Valley Falls, Rockville, Southbridge and Melrose branches, with headquarters at Hartford.

Northern Pacific.—H. D. Sanborn is Purchasing Agent of Western Division, with office at Portland, Oregon.

Ohio Central.—John E. Martin has been appointed General Superintendent. He was formerly President and Superintendent of the Evansville & Terre Haute road.

Oregon Railway & Navigation Co.—J. M. Fillmore has been appointed Superintendent of the Railroad Division. He was formerly Superintendent of the North Pacific Coast road, and more recently of the Oregonian Railway.

Peach Bottom.—S. M. Manifold has resigned the position of Superintendent. He has long been connected with the road.

Richmond & Petersburg R. R.—J. R. Kenley has been appointed Superintendent, vice Theo. D. Kline, resigned.

Savannah, Florida & Western.—A. A. Aveilhé has been appointed Purchasing Agent, vice W. B. McKee appointed Controller.

St. Louis & Cairo.—This company is the successor of the Cairo & St. Louis. Chas. Hamilton is Superintendent and R. M. Pringle Superintendent of Machinery.

St. Louis, Iron Mountain & Southern.—Wilson Garrison is appointed Master Mechanic in charge of the shops at Texarkana, which are used both by this road and the Texas & Pacific. Thomas Ormerod continues Foreman of the locomotive shops and W. J. Arthur Foreman of the car shops.

St. Paul, Minnesota & Manitoba.—C. O. Wheeler having resigned as Superintendent of Northern Division, D. K. Smith is appointed Division Superintendent, with headquarters at Crookston, and will have charge of the lines north of Fergus Falls, including the line from Breckenridge to Barnesville.

Texas & Pacific.—J. S. Noble has resigned his position as Superintendent of the Transcontinental Division.

Wabash, St. Louis & Pacific.—W. F. Merrill has resigned the position of Assistant General Superintendent; R. S. Minor has been appointed Superintendent of St. Louis Division, which now includes the St. Louis & Kansas City Division, vice G. B. Parcell and M. G. Cary.

Employment.

Advertisements will be inserted under this heading for one dollar for each insertion.

WANTED.—A position on a growing railroad by a young man who has been head clerk four years in a department office of a leading New England road. Has a fair position at present, but no chances for promotion; is a rapid penman, accurate accountant, and understands telegraphy. Can refer to present employer. Address "West," care NATIONAL CAR-BUILDER.

WANTED.—A position as Master Car-Builder, or General Foreman of a railroad car department; or as Shop Inspector of Rolling Stock under construction, or as Car Tracer. Satisfactory references given as to capacity, etc. Would prefer a position at the South or Southwest. Address "H," office of NATIONAL CAR-BUILDER.

DIRECTORY

[of] the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 62 m. 3 lo. 62 cars.
C. E. Durkee, *Supt* ...Saratoga, N. Y.
Jacob Myers, *M. M* ...Saratoga, N. Y.
Jas. J. Travers, *M. C. B* ...Saratoga, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albert R[illegible] 4-8½ g. 51 m. 3 lo. 32 cars.
G. A. Robinson, *Manager* ...Hillsboro, N. B.
Jas. McKay, *M. M. & C. B* ...Hillsboro, N. B.
Allegany Central R. R. 3 gauge 30 miles.
Geo. D. Chapman, *Gen. Man*...Angelica, N. Y.
W. O. Chapman, *Gen. Supt*...Friendship, N. Y.
[illegible]y R. R. 4-9 g. 259 m. 75 lo. 1968 c.
[illegible]Cargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.)...Pittsburg, Pa.
A. A. Jackson, *Supt.* (L. G. Div.) Brookville, Pa.
Geo. W. Glass, *M. M* ...Verona, Pa.
R. Gunning, *M. C. B* ...Verona, Pa.
Alliance & Lake Erie R. R. 3 g. 30 m. 3 lo. 112 cars.
W. F. Lewis, *Gen. Man* ...Alliance, O.
C[illegible]man, *M. M. & M. C. B*...Alliance, O.
[illegible]b. & St. L. R. R 4-9 g. 19 m. 2 lo. 20 c.
J. A. Larnerd, *Rec. & Supt* ...Anderson, Ind.
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt*...Annapolis, Md.
John L. Beall, *M. Mach* ...Annapolis, Md.
Arkansas Midland R. R. 3-6 g. 48 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man*...Helena, Ark.
J. B. Johnson, *M. M. & M. C. B*...Helena, Ark.
Ashland Coal & Iron Ry. 4-8½ g. 14 m. 2 lo. 122 c
Douglas Putnam, Jr., *Gen. Supt*..Ashland, Ky.
Robt. Peebles, *Pur. Agt* ...Ashland, Ky.
E. M. Roberts, *M. M* ...Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
[As]heville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt*..Spart'b'g, S.C.
Wm. Platt, *M. M* ...Spartanburg, S. C.
W. B. Brown, *M. C. B* ...Spartanburg, S. C.
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 1,846 m. 203 lo. 8,108 cars.
C. C. Wheeler, *Gen. Man* ...Topeka, Kan.
D. J. Chase, *Gen. Supt* ...Topeka, Kan.
W. S. Mellen, *Asst. Gen. Supt*...Topeka, Kan.
F. M. Smith, *Pur. Agt* ...Topeka, Kan.
Geo. Hackney, *Supt. Lo. & Car. Dept* do.
Clem. Hackney, *M. M.* ...Topeka, Kan.
Eastern Div.: C. M. Rathbun, *Supt*..Topeka, Kan
Henry Hull, *G. F. Car Dept* ...Topeka, Kan.
John Fagan, *M. M* ...Atchison, Kan.
J. M. Smith, *M. M* ...Kansas City, Mo.
W. W. Wheeler, *M. M.* ...Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.* Nickerson, Kan.
W. Y. Johnson, *M. M* ...Nickerson, Kan.
J. Q. Adams, *M. M* ...Dodge, Kan.
Col. Div.: W. W. Borst, *Supt* ...La Junta, Col.
A. C. Stiles, *M. M* ...La Junta, Col.
H. W. Somers, *M. M* ...Raton, N. M.
Las Vegas D.: T. J. Seeley, *Supt.* Las Vegas, N.M.
L. H. Waugh, *M. M* ...Las Vegas, N. M.
Rio G. Div.: F. Leach, Jr., *Supt.* San Marcial, N.M.
M. C. Wheeler, *M. M* ...Wallace, N. M.
T. Clyde, *M. M* ...San Marcial, N. M.
H. P. Olcott, *M. M* ...Deming, N. M.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & Pacific R. R. 4-8½ g. 286 m.
F. W. Smith *Gen. Supt* ...Albuquerque, N. M.
B. W. Angell, *Div. Supt* ...Albuquerque, N. M.
Geo. Chalender, *Supt. M. P. & M.* do.
D. B. Sibley, *Pur. Agt* ...Chicago, Ill.
Augusta & Knoxville R. R. 30 miles.
A. J. Twiggs, *Gen. Supt & M. M.*..Augusta Ga.

B

Baltimore & Ohio R. R.
4-8½ g. 1,539 m. 546 lo. 14,862 cars.
N. S. Hill, *Pur. Agt* ...Baltimore, Md.
E. Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans*...Baltimore, Md
N. E. Chapman, *Mast. of Mach*..Baltimore, Md.
A. J. Cromwell, *Asst. M. of M* .Baltimore, Md.
L. Packard, *M. C. B* ...Baltimore, Md.
I. N. Kalbaugh, *M. M* ...Baltimore, Md.
Wm. Edwards, *M. M*..Martinsburgh, W. Va.
Sam. Houston, *M. M* ...Piedmont, W. Va.
Robert Maxwell, *M. M* ...Cumberland, Md.
S. B. Crawford, *M. M* ...Grafton, W. Va.
Alex. Laird, *M. M* ...Parkersburg, W. Va.
Chas. Hirsch, *M. M* ...Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt*...Pittsburg, Pa
J. E. Sampsell, *M. of Mach* ..Connelsville, Pa.
Trans-Ohio Divs.: B. Dunham, *G. Man* ..Newark, O.
W. H. Harrison, *Mast. of Mach*...Newark, O.
E. L. Weisgerber, *M. M* ...Newark, O.
H. M. Ingler, *M. M* ...Bellaire, O.
O. B. Perkins, *M. M* ...Zanesville, O.
Andrew Beckert, *M. M* ...Sandusky, O.
F. J. Gunther, *M. M*...Chicago Junction, O.
Chi. Div.: John Thomas, *Supt* ...Chicago, Ill.
Benj. Lowther, *M. M* ...Garrett, Ind.
W. H. Wilkinson, *M. M* ...Kingston, Ill.
Baltimore & Potomac R. R. (*See Penna. R. R.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt* ...Bangor, Me.
C. S. Nason, *M. M* ...Bangor, Me.
J. W. Comins, *M. C. B* ...Oldtown, Me.
Barclay R. R. 4-8½ g. 16 miles.
F. F. Lyon, *Supt* ...Barclay, Pa.
J. A. Hardenburg, *Pur. Agt*..21 Cort. st., N. Y.
Wm. Johnson, *M. M* ...Towanda, Pa.
Bath & Hammondsport R. R. 3 g. 9 m. 1 lo. 15 cars.
M. H. Hall, *Supt* ...Hammondsport, N. Y.
Allen Wood, *M. M* ...Hammondsport, N. Y.
Battle Mountain & Lewis Ry. 3 gauge 11 miles.
L. B. Ball, *Supt. & Pur. Agt* ...Lewis, Nev.
Bedford, Springville, Owensburg & Bloomfield Ry.
3 g. 41 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M* ...Bedford, Ind.
Richard G. Elliott, *M. C. B* ...Bedford, Ind.
Bellaire & South-Western Ry. Co. 3 g. 42 m. 3 lo. 29 c.
S. J. Cochren, *Gen. Man* ...Bellaire, O.
Bell's Gap R R. 3 g. 23 m. 2 lo. 35 cars.
R. G. Ford, *Supt* ...Bellwood (P. O.), Pa.
A. Zimmerman, *M. C. B* ...Bellwood, Pa.
[Be]lt R. R. 4-8½ g. 12 m. 10 lo.
M. A. Downing, *Gen. Man* ...Indianapolis, Ind.
Bennington & Rutland Ry. 4-8½ g. 9 m. 10 lo. 214 c.
F. C. White, *Supt. & Pur. Agt*..Bennington, Vt.
G. W. Blanchard, *M. M* ...Rutland, Vt.
Bingham, Canyon & Camp Floyd, and
Wasatch & Jordan Valley R. R.'s.
3 g. 44 m. 7 lo. 300 cars.
J. G. Kennedy, *Gen. Man*..Salt Lake City, Utah
Geo. M. Young, *Supt* ... do. do.
Bodie Lumber Co. 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt* ...Bodie, Cal
E. M. Luckett, *M. M. & C. B* ...Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 36 m. 7 lo. 107 c.
H. M. Witter, *Supt. & Pur. Agt.* Worcester, Mass.
Chas. F. Brigham, *M. M* ...Worcester, Mass.
Boston, Concord, Montreal & White Mts. R. R.
4-8½ g. 167 m. 34 lo. 677 cars
James A. Dodge, *Gen. Man*...Plymouth, N. H.
J. Thos. Vose, *Pur. Agt* ...Boston, Mass.
R. Adams, *M. M* ...Lake Village, N. H.
G. A. Ferguson, *Asst. M. M*...Lake Village, N. H.
L. D. Pickering, *M. C. B*...Lake Village, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 53 m. 17 lo. 1,112 cars.
W. L. Burt, *Pres. & Gen. Man*...Boston, Mass.
J. L. Wellington, *Gen. Supt.* Mechanicville, N. Y.
J. L. Wellington, *P. A.* ...Mechanicville, N. Y.
W. H. Powell, Jr., *M. M*...Mechanicville, N. Y.
John S. Ellis, *M. C. B* ...Mechanicville, N. Y.
Boston, Lowell & Concord R. Rs.
4-8½ g. 360 m. 110 lo. 2,211 cars.
H. C. Sherburne, *Gen. Man* ...Boston, Mass
F. H. Nourse, *Pur. Agt* ...Boston, Mass.
Jas. T. Gordon, *M. M* ...Concord, N. H.
J. N. Lauder, *Supt. Roll. Stock* .Concord, N.H.
Boston & Lowell Div.:
J. F. Crockett, *M. Trans* ...Boston, Mass.
Concord Divs.:
H. E. Chamberlain, *Supt*..Concord, N. H.
J. T. Gordon, *M. M. & C. B.* Concord, N. H.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 5 lo. 46 c.
E. H. Whorf, *Supt. & Pur. Agt*...Boston, Mass.
J. L. Folsom, *M. M* ...Boston, Mass.
John Coghlan, *M. C. B* ...Boston, Mass.
Boston, Winthrop & Pt. Shirley. 3 g. 2½ m. 1 lo. 8 c.
C. A. Parks, *Man* ...Boston, Mass.
A. E. Walker, *M. M* ...Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 248 lo. 6,012 c.
C. O. Russell, *Gen. Supt* ...Springfield, Mass.
W. H. Barnes, *Asst. Supt* ...Boston, Mass.
A. B. Underhill, *Supt. M. P* ...Springfield, Mass.
F. D. Adams, *M. C. B* ...Allston, Mass.
W. H. Russell, *Div. Supt* ...Albany, N. Y.
Horace Eddy, *For. M. Sh*..Springfield, Mass.
J. B. Weston, *For. C. Sh*..Springfield, Mass.
G. H. Colby, *For. M. Sh* ...Boston, Mass.
T. B. Purvis, *For. M. Sh* ...Greenbush, N. Y.
J. E. Doran, *For. C. Sh* ..Greenbush, N. Y.
Boston & Maine R. R. 4-8½ g. 206 m. 84 lo. 2,100 c.
J. T. Furber, *Gen. Supt. & P. A*..Boston, Mass.
Wm. Smith, *M. M* ...Boston, Mass.
D. C. Richardson, *M. C. B* ...Lawrence, Mass.
Boston & N. Y. Air Line. 4-8½ g. 53 m. 9 lo. 156 c.
Jos. H. Franklin, *Supt* ...New Haven, Conn.
Boston & Providence R. R. 4-8½ g. 67 m. 47 lo. 866 c.
A. A. Folsom, *Gen. Supt* ...Boston, Mass.
Geo. Richards, *M. M* ...Roxbury, Mass.
Jno. Lightner, *M. C. B* ...Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 5 m. 2 lo. 2 cars.
W. A. Wiggins, *Gen. Man*...Bowling Green, O.
H. B. Wiggins, *Supt. & M.M* Bowling Green, O.
Bradford R. R. (*See Buff., N. Y. & Chi.*)
Bradford, Bordell & Kinzua R. R. 3 g. 30 m. 6 lo. 80 c.
B. C. Williams, *Supt. & Pur. Agt*..Bradford, Pa.
John Delaney, *M. M. & C. B* ...Bradford, Pa.
Bradford, Eldred & Cuba R. R.
C. D. Williams, *Supt. & P. A*..Wellesville, N. Y.
Breakwater & Frankford R. R. (*See Junc. & Break.*)
Brighthope Ry. 3 g. 37 m. 3 lo. 193 cars.
Jas. R. Worth, *Supt* ...Richmond, Va.
A. Gary, *Supt. Way & Works*.Winterpock, Va.
Alex. Calder, *M. M* ...Chester, Va.
Brooklyn, Bath & Coney Is. 4-8½ g. 7 m. 6 lo. 33 c.
Geo. A. Gunther, *Gen. Man*...Brooklyn, N. Y.
B'klyn, Flatbush & Coney Is. 4-8½ g. 7½ m. 7 lo. 52 c.
Robert White, *Supt* ...Brooklyn, N. Y.
Brooklyn & Rockaway Bch. 4-8½ g. 3½ m. 3 lo. 18 c.
Wm. Warner, *Supt* ...E. New York, N. Y.
Brunswick & Albany R. R. 5 g. 172 m. 13 lo. 170 c.
R. D. Meader, *Supt* ...Brunswick, Ga.
Buffalo, N.Y. & Phila. Ry. 4-8½ g. 121 m. 34 lo. 2,436 c.
Geo. S. Gatchell, *Gen. Supt* ...Buffalo, N. Y.
J. H. Poole, *Pur. Agt* ...Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M* ...Buffalo, N. Y.
Henry Wagner, *M. M* ...Buffalo, N. Y.
Buff. Div.: J. T. Gardiner, *Supt*...Buffalo, N. Y.
N. G. Div.: J. W. Watson, *Supt* ...Olean, N. Y.
Buff., Pittsburg & W'n R. R. 4-9 g. 165 m. 33 l. 506 c.
Oliver Watson, Jr., *Gen. Supt*...Oil City, Pa.
E. H. Witter, *Pur. Agt* ...Buffalo, N. Y.
H. J. Bookhammer, *M. M* ...Oil City, Pa.
John Monks, *M. C. B* ...Oil City, Pa.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 644 m. 62 lo. 2,120 cars.
C. J. Ives, *Gen. Supt* ...Cedar Rapids, Ia.
Robt. Williams, *Supt* ...Cedar Rapids, Ia.
T. Stickney, *Pur. Agt* ...Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C.B.* Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 36 m. 3 lo. 61 c.
G. L. Linsley, *Gen. Man. & Supt.* Burlington, Vt.
F. G. Brownell, *M. M. & P. A*...Burlington, Vt.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C., B. & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 85 c.
John T. Gerry, *Supt* ...Burlington, Ia.
Burlington & Ohio River R. R.
G. P. Merrill, *Gen. Man. & Pur. Agt.* Chicago, Ill.
J. K. Lape, *Supt. of Equip* ...Chicago, Ill.

C

Camden & Atlantic R. R. 4-8½ g. 79 m. 16 lo. 264 c.
F. A. Lister, *Supt & Pur. Agt*...Camden, N. J
Rufus Hill, *M. M* ...Camden, N. J.
Samuel Wills, *M. C. B* ...Camden, N. J.
Canada Southern Ry. 4-8½ g. 403 m. 89 l. 3,367 c.
W. P. Taylor, *Gen. Man* ...Buffalo, N. Y.
A. F. Howland, *Pur. Agt* ...St. Thomas, Ont.
W. A. Short, *Gen. M. M* ...St. Thomas, Ont.
Gen. M. C. B...St. Thomas, Ont.
Can. Div.: W. E. Carroll, *Supt*..St. Thomas, Ont.
Robert Potts, *M. C. B* ...St. Thomas, Ont.
U. S. Div.: E. P. Murray, *Supt* ...Toledo, O.
O. P. Dunbar, *M. M* ...Grosse Isle, Mich.
Canadian Pacific R. R. 4-8½ g. 551 m. 26 lo. 473 c.
W. C. Van Horne, *Gen. Man.* Winnipeg, Man.
Eastern Div. 240 m. 16 lo. 276 cars.
Archer Baker, *Gen. Supt* ...Montreal, Can.
Tho. Irwin, *Mech. Supt* ...Brockville, Ont.
Western Div. 311 m. 10 lo. 207 cars.
A. B. Stickney, *Gen. Supt*...Winnipeg, Man.
Geo. P. Nelson, *Pur. Agt* ...Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B.* Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 47 m. 3 lo. 31 c.
L. C. Jones, *Gen. Supt* ...Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B.*.Fayetteville, N. C.
Caroline Central R. R. (*See Ral. & Aug.*)
Carson & Colorado R. R. (*See Va. & Truckee.*)
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 577 c.
C. W. Chapman, *Supt. & P. A.* Catasauqua, Pa.
Thos. E. Evans, *M. M* ...Catasauqua, Pa.
Chas. J. Holbach, *M. C. B* ...Catasauqua, Pa.
Central and South-Western Railroads (Ga.).
5 g. 975 m. 127 lo. 1,858 cars.
W. G. Raoul, *V. P. and G. Man.* Savannah, Ga.
Wm. Rogers, *Gen. Supt* ...Savannah, Ga.
Henry Yonge, *Pur. Agt* ...Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M* ...Savannah, Ga.
John McCann, *M. M* ...Augusta, Ga.
R. M. Barthlemess, *M. C. B*...Savannah, Ga.
So.-West'n Div.: W. F. Shellman, *Supt.* Macon, Ga.
D. M. Gugel, *M. M* ...Macon, Ga.
James A. Knight, *M. C. B* ...Macon, Ga.
Central R. R. of N. J. 4-8½ g. 544 m. 294 lo. 27,198 c.
Gen. Man...New York, N. Y.
B. W. Burnett, *Pur. Agt* ...New York, N. Y.
W. W. Stearns, *Gen. Supt* ...Elizabeth, N. J.
Cen Div.: Wm. Woodcock, *M. M*..Elizabeth, N. J.
Geo. Hackett, *M. C. B* ...Elizabeth, N. J.
C. G. Williams, *M. M* ...Jersey City, N. J.
John Alpaugh, *M. M* ...Phillipsburg, N. J.
Long Br. Div.: J. F. Randolph, *Supt.* Elizabeth, N. J.
N. J. So. Div.: R. Blodgett, *Supt* ...Manchester, N. J
Wm. Montgomery, *M. M* ...Manchester, N. J.
Chas. N. Sawyer, *M. C. B*...Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *A. G. Supt.* Mauch Chunk, Pa.
L. C. Brastow, *M. M. & C. B* ...Ashley, Pa.
Central R. R. of S. C. (*See Wil. & Wel.*)
Central Iowa Ry. 4-8½ g. 244 m. 37 lo. 1,487 cars.
D. N. Pickering, *Gen. Supt*...Marshalltown, Ia.
John Player, *M. M.* ...Marshalltown, Ia.
T. L. Seevers, *M. C. B* ...Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 32 m. 2 lo. 15 cars.
Geo. W. McMullen, *Gen Man* ...Picton, Ont.
Central Pac. R. R. 4-8½ g. 2,777 m. 296 lo. 7,277 c.
A. N. Towne, *Gen. Man* ...San Francisco, Cal.
J. A. Fillmore, *Gen. Supt*...San Francisco, Cal.
R. H. Pratt, *A. G. Supt* ...San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt*..Sacramento, Cal.
A. J. Stevens, *Gen. M. M* ...Sacramento, Cal.
Benj. Welch, *Gen. M. C. B* ...Sacramento, Cal.
G. J. Turner, *M. C. B* ...Sacramento, Cal.
West'n; Visalia Tulare Divs. and North'n R. R.:
A. D. Wilder, *Supt* ...W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) W. Oakland, Cal.
W. D. Ludlow, *M. C. B.* (W. Div.) do.
S. J. Johnson, *M. M.* (T. Div.)...Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.).S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
J. B. Wright, *Supt* ...Sacramento, Cal.
M. W. Cooley, *M. M* ...Sacramento, Cal.
Phil. Douglas, *For. Car Sh*..Sacramento, Cal.
Truckee Div.: Frank Free, *Supt.* Wadsworth, Nev.
Geo. Gregg, *M. M* ...Wadsworth, Nev.
Wm. McPherson, *F. Car Sh*..Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt.* Carlin, Nev.
W. F. Smith, *M. M* ...Carlin, Nev.
J. C. Doughty, *For. Car Sh* ...Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt* ...Ogden, Utah.
James Lamb, *M. M* ...Terrace, Utah.
A. Sherburne, *For. Car Sh* ...Ogden, Utah.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt* ...Los Angeles, Cal.
James Velsir, *M. M* ...Los Angeles, Cal.
J. S. Young, *For. Car Sh*...Los Angeles, Cal.
Arizona Div. (So. Pac.):
A. A. Bean, *Asst. Supt* ...Tucson, Ariz.
Rio Grande and El Paso Divs. (So. Pac.):
J. Campbell, *Ass't Supt* ...El Paso, Texas.
H. C. Standish, *For. Sh* ...El Paso, Texas.
Central Vermont R. R. 4-8½ g. 548 m. 132 lo. 2,522 c.
J. W. Hobart, *Gen. Supt* ...St. Albans, Vt.
J. M. Foss, *A. G. S. & S. of M. P. & M.* St. Albans, Vt
No. Div.: J. B. Futvoye, *Supt* ...St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt* ...Rutland, Vt.
N. L. Davis, *M. M. & C. B* ...Rutland, Vt.
New London & No'n R. R. 143 m. 22 lo. 303 c.
G. W. Bentley, *G. Supt. & P. A*...New London, Ct.
I. W. Dow, *M. M* ...New London, Ct.
S. O. Banks, *M. C. B* ...New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 miles.
Wm. Hutchings, *G. M. & P. A.* Chagrin Falls, O.
J. W. Williams, *Supt* ...Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 98 c)
C. S. Gadsden, *Gen. Supt* ...Charleston, S. C.
H. A. Ulmo, *M. M* ...Savannah, Ga.
J. D. Murphy, *M. C. B* ...Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 6 lo. 125 cars.
A. L. Inman, *Gen. Man* ...Plattsburg, N. Y.
J. M. Davis, *Supt. & M. M*...Plattsburg, N. Y.
Chatham Branch Ry. 4-8½ g. 9 m. 1 lo. 2 cars.
J. B. Snowball, *Manager* ...Chatham, N. B.
Chattaroi Ry. 4-8½ g. 43 miles 11 loco. 483 cars.
C. H. Rockwell, *Gen. Man. & P. A.* Ashland, Ky.
W. C. Pendleton, *M. M* ...Ashland, Ky.
Joseph Burley, *M. C. B* ...Ashland, Ky.
Cheraw & Chester R. R. 3 g. 30 m. 3 lo. 38 cars.
W. H. Harding, *Pres. & Supt* ...Chester, S. C.
A. M. Manning, *M. M* ...Chester, S. C.
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
Cherokee R. R. 3 g. 37 m. 5 lo. 50 cars.
John Postel, *Manager* ...Atlanta, Ga.
C. E. Scruten, *M. M. & C. B*...Cedartown Ga.
Chesapeake, Ohio & So.-W'n. 5 g. 365 m. 8 lo. 102 c.
R. Meek, *G. S. & Pur. Agt.* Elizabethtown, Ky.
W. D. Robb, *M. M* ... do.
C. A. Simon, *M. M. & C. B* ...Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 133 l. 3,543 c.
C. W. Smith, *Gen. Man* ...Richmond, Va.
A. H. Wood, *Asst. to Gen. Man* ... do.
A. S. Emmons, *Pur. Agt* ...Richmond, Va.
John McFarland, *Supt. M. P* ...Richmond, Va.
Eastern Div.: E. T. Smith, *Supt*..Richmond, Va.
J. N. King, *M. C. B* ...Richmond, Va.
Hunt. Div.: W. P. Harris, *Supt.*; and
T. L. Chapman, *Asst. Supt. M. P.*; and
H. C. Bassinger, *M. C. B.* Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt.* Lexington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 30 lo. 499 cars.
R. Stewart, *Gen. Man* ...Keene, N. H.
H. H. Stone, *Pur. Agt* ...Keene, N. H.
F. A. Perry, *M. M* ...Keene, N. H.
A. E. Howard, *G. For. Car Sh* ...Keene, N. H.
Chester & Lenoir Ry. 3 g. 50 m. 3 lo. 23 cars.
James Mason, *Supt* ...Yorkville, S. C.
T. P. Beard, *M. M* ...Yorkville, S. C.
Chicago, B. & Kan. City Ry. 4-8½ g. 181 m. 9 lo. 130 c.
J. W. Smith, *Gen. Supt* ...Keokuk, Ia.
W. H. Bartlett, *Act. M. M* ...Burlington, Ia.
A. B. Allen, *M. C. B* ...Farmington, Ia.
Chicago, Burlington & Quincy R. R.
4-8½ g. 2,924 m. 441 lo. 16,499 cars.
T. J. Potter, *Gen. Man* ...Chicago, Ill.
H. B. Stone, *Supt. Lo. & Car Dept*..Chicago, Ill.
Wm. Forsyth, *Mech. Eng* ...Aurora, Ill.
(1) C., B. & Q., East of Mo. Riv. 1,938 miles.
H. B. Stone, *Gen. Supt* ...Chicago, Ill.
Geo. B. Harris, *Pur. Agt* ...Chicago, Ill.
Ill. Divs.: J. D. Besler, *Supt* ...Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt* ...Aurora, Ill.
L. E. Johnson, *M. M* ...Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt.* Galesburg, Ill.
Robert Colville, *M. M* ...Galesburg, Ill.
St. L. Div.: S. E. Crance, *Supt* ...St. Louis, Mo.
A. Forsyth, *M. M* ...Beardstown, Ill.
Ia. & Mo. Divs.: K. H. Wade, *Supt*..Burlington, Ia.
East. Div.: C. M. Levy, *Supt* ...Burlington, Ia.
Joel West, *M. M* ...Burlington, Ia.
Mid. Div.: D. T. Bacon, *Supt* ...Ottumwa, Ia.
West'n Div.: W. T. Ryder, *Supt* ...Creston, Ia.
C. W. Eckerson, *M. M* ...Creston, Ia.
(2) C., B. & Q., West of Mo. Riv. 935 miles.
G. W. Holdredge, *Gen. Supt* ...Omaha, Neb.
Geo. Hargreaves, *Pur. Agt* ...Omaha, Neb.
D. Hawksworth, *Gen. M. M*..Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
J. B. Phillippi, *Supt* ...Lincoln, Neb.
O. R. Newton, *M. M* ...Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt* ...Hastings, Neb.
A. & N. Div.: J. McConniff, *Supt*...Lincoln, Neb.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 3,951 m. 425 lo. 13,659 cars.
S. S. Merrill, *Gen. Man* ...Milwaukee, Wis.
J. T. Clarke, *Gen. Supt* ...Milwaukee, Wis.
J. T. Crocker, *Pur. Agt* ...Milwaukee, Wis.
J. M. Lowry, *Gen. M. M* ...Milwaukee, Wis.
H. Watkeys, *M. M* ...W. Milwaukee, Wis.
John Baillie, *Supt. Car Dept*...Milwaukee, Wis.
La Crosse; Pr. du Chien; Wis. Val.; Chi.; and
Chi. & Pac. Divs.:
H. C. Atkins, *Supt* Milwaukee, Wis.
Northern Div.: L. B. Rock, *Supt*..Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B*..Milwaukee, Wis.
So.-Wn. Divs.: D. A. Olin, *Supt* ...Racine, Wis.
John Taylor, *M. M* ...Racine, Wis.
E. A. Eddy, *M. C. B* ...Racine, Wis.
Lines West of Mississippi River:
C. H. Prior, *A. Gen. Supt*...Minneapolis, Minn.
H. & D. Div.: C. W. Case, *Supt.* Minneapolis, Minn.
J. O. Pattie, *M. M* ...Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.* do.
So. M. Div.: F. D. Underwood, *Supt.* La Crosse, Wis
Ia. & Da. Div.: G. W. Sanborn, *Supt.* Mason City, Ia.
S. Cy. & Da. Div.: J. Jackson, *Supt.* Sioux City, Ia.
F. H. Moulton, *M. M* ...Yankton, Dak.
M. Pt. Div.: G. W. Cobb, *Supt*...Mineral Pt., Wis.
Dubuque Div.: J. H. Jenkins, *Supt*..Dubuque, Ia
S. Charnley, *M. M* ...Dubuque, Ia.
Chicago, Pekin & So.-Wn. R.R. 4-8½ g. 88 m. 8 lo. 455 c.
J. Murray, *Supt. & Pur. Agt* ...Streator, Ill.
A. H. Cook, *Pur. Agt* ...Chicago, Ill.
A. R. Overton, *M. M* ...Joliet, Ill.
F. Shields, *M. C. B* ...Streator, Ill.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 290 lo. 17,799 cars.
R. R. Cable, *V. P. & Gen. Man*...Chicago, Ill.
A. Kimball, *Gen. Supt* ...Davenport, Ia.
F. A. Marsh, *Pur. Agt* ...Chicago, Ill.
T. B. Twombly, *Gen. M. M* ...Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B* ...Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt* ...Chicago, Ill.
R. Biester, *M. M* ...Chicago, Ill.
Sam'l Pullman, *M. C. B* ...Chicago, Ill.
Ia. Div.: H. F. Royce, *Supt* ...Des Moines, Ia.
J. G. Crockett, *M. M* ...Stuart, Ia.
Jas. E. Morrill, *M. M* ...Davenport, Ia.
Chas. M. Leonard, *M. C. B* ...Davenport, Ia.
So.-Wn. Div.: G. F. Walker, *Supt* ...Trenton, Ia.
R. A. Carscadin, *M. M* ...Trenton, Ia.
Chas. R. Best, *M. C. B* ...Trenton, Ia.
K. & Des. M. Div.: Jno. Given, *Supt*...Keokuk, Ia.
S. W. Wakefield, *M. M* ...Keokuk, Ia.
Henry Kummer, *M. C. B* ...Keokuk, Ia.
Chi., Saginaw & Can. R. R. 4-8½ g. 38 m. 4 lo. 16 c.
J. A. Elwell, *Gen. Man. & Pur. Agt.* St. Louis, Mich.
Jas. T. Hall, *Supt* ...St. Louis, Mich.
Chicago, St. Louis & New Orleans R. R.
4-8½ g. 571 m. 101 lo. 1,913 cars.
J. C. Clarke, *V. P. & G. Man*..New Orleans, La
L. T. Brien, *Asst. Gen. Man*..New Orleans, La.
C. M. Sheafe, *Gen. Supt* ...New Orleans, La.
H. B. Febiger, *Pur. Agt* ...New Orleans, La.
W. H. Purdy, *Supt. Mach*..McComb City, Miss.
Geo. W. Baxter, *M. C. B*...McComb City, Miss.
So. Div.: E. D. Anderson, *Acting Supt.* do.
E. D. Anderson, *M. M*...McComb City, Miss.
No. Div.: J. G. Mann, *Supt* ...Jackson, Tenn.
J. M. Keith, *M. M* ...Jackson, Tenn.
J. F. White, *M. M* ...Water Valley, Miss.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 963 m. 125 lo. 3,565 cars.
C. F. Hatch, *Gen. Supt* ...St. Paul, Minn.
W. H. S. Wright, *Pur. Agt* ...St. Paul, Minn.
Matt. Ellis, *M. M* ...St. Paul, Minn.
W. B. Rice, *M. C. B* ...St. Paul, Minn.
Ea. & No. Div.: H. Spencer, *Supt.* St. Paul, Minn.
St. Paul Div.: J. F. Lincoln, *Supt.* St. Paul, Minn.
Sioux City Div.: T. P. Gere, *Supt.* Sioux City, Ia.
F. W. Heintselman, *Gen. For. Sh.* Sioux Cy, Ia.
Neb. Div.: G. V. Morford, *Supt* ...Omaha, Neb.
Chicago, Texas & Mexican Central Ry.
4-8½ g. 52 m. 4 lo. 60 cars.
J. T. Odell, *Gen. Supt* ...Dallas, Tex.
Chas. Howard, *Pur. Agt* ...Chicago, Ill.
Chicago & Alton R. R. 4-8½ g. 840 m. 213 lo. 6,148 c.
J. C. McMullin, *Gen. Man* ...Chicago, Ill.
W. F. Merrill, *Gen. Supt* ... do.
A. V. Hartwell, *Pur. Agt* ...Chicago, Ill.
Wm. Wilson, *Supt. of Mach*...Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept.* do.
Chi. Div.: A. M. Richards, *Supt*..Bloomington, Ill.
St. Louis Div.: T. M. Bates, *Supt*..Roodhouse, Ill.
Kan. Cy. Div.: O. Vaughan, *Supt* ...Slater, Mo.
Wm. McPhail, *M. M* ...Slater, Mo.
Chicago & Block Coal Ry. 4-9 g. 15 m.
A. F. Beach, *Gen. Man* ...Veedersburg, Ind.
Chi. & East'n Ill. 4-8½ g. 248 m. 56 lo. 3,000 cars.
O. S. Lyford, *Gen. Supt* ...Chicago, Ill.
D. R. Patterson, *Pur. Agt* ...Chicago, Ill.
P. W. Drew, *M. Trans* ...Chicago, Ill.
Allen Cook, *M. M* ...Danville, Ill.
Jas. T. Kerney, *M. C. B* ...Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Iowa R. R. 4-8½ g. 104 m. 15 lo. 237 cars.
W. H. Holcomb, *Rec* ...Rochelle, Ill.
H. S. Bryan, *M. M* ...Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,281 m. 476 lo. 16,673 cars.
Marvin Hughitt, *2d V. Prs. & G. M.* Chicago, Ill.
J. D. Layng, *Gen. Supt* ...Chicago, Ill.
W. G. Brownson, *Asst. Supt* ...Boone, Ia.
R. W. Hamer, *Pur. Agt* ...Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
J. M. Boon, *A. Supt. M. P. & M* ...Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Chas. D. Gorham, *Supt* ...Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt* ...Chicago, Ill.
Pen'r Div.: W. B. Linsley, *Supt*...Escanaba, Mich.
Geo. H. White, *M. M* ...Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt*..Baraboo, Wis.
Win. & St. P. Div.: S. Sanborn, *Supt.* Winona, Minn
W. A. Scott, *M. M* ...Winona, Minn.
Dak. Cen. Ry.: T. J. Nicholl, *Supt*...Huron, Dak.
Mil. & Mad. Ry.: J. B. Trull, *Supt* ...Galena, Ill.
Ia. Div.: J. M. Whitman, *Supt* ...Clinton, Ia.
J. O. Chapman, *M. M* ...Clinton, Ia.
H. L. Preston, *M. C. B* ...Clinton, Ia.
No. Ia. Div.: H. G. Burt, *Supt* ...Eagle Grove, Ia.
Chicago & West Michigan:
4-8½ g. 366 m. 43 lo. 1,345 cars.
Geo. C. Kimball, *V. P. & G. Man*..Muskegon, Mich.
C. Harris, *Gen. Supt* ... " "
H. Park, *Pur. Agt* ... " "
L. E. Hitchcock ... " "
C. & W. M. Rd: C. M. Lawler, *Supt.* St. Joseph, Mich.
Russell Booth, *M. M* ...Muskegon, Mich.
Gr. Hav. Rd.: F. H. May, *Manager*.Allegan, Mich.
Russell Booth, *M. M* ...Muskegon, Mich.
Gr. Rap. Rd.: A. M. Nichols, *Supt.* Gr. Rapids, Mich
C. J. Howard, *M. M* ...Grand Rapids, Mich.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 1 lo. 27 cars.
J. E. Gimperling, *Gen Man* ...Dayton, O.
Geo. F. Robinson, *Supt* ...Washington, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 2 lo. 39 c.
A. T. Roever, *Gen Man* ...Cincinnati, O.
J. C. Homer, *M. M* ...Cincinnati, O.
Cincinnati, Green Riv. & Nashville R. R. 3 g.
A. C. Sim, *Supt* ...King's Mountain, Ky.
G. Brashears, *Pur. Agt* ...Cincinnati, O.
Cincinnati, Hamilton & Dayton R. R. (*See C., C., C. & I.*)
Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 345 m. 60 lo. 1,930 cars.
J. W. Sherwood, *Supt* ...Indianapolis, Ind.
Geo. Tozzer, *Pur. Agt* ...Cincinnati, O.
J. S. Patterson, *M. of Mach. & M. C. B.* Cincinn., O.
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 841 m. 96 lo. 2,687 cars.
John Scott, *V. Pres. & Gen. Man*..Cincinnati, O.
James Meehan, *Gen. M. M* ...Ludlow, Ky
Cin. So. Div.: Cecil Fleming, *Gen. Supt*..Cin., O.
Julius Uihlein, *Pur. Agt* ...Cincinnati, O.
Frank Allingham, *M. M* ...Cincinnati, O.
A. Thomson, *M. M* ...Chattanooga, Tenn.
Ala. Gr. S'n Div.: C. B. Wallace, *Gen. Supt*.. and
R. W. Healey, *Pur. Agt* ...Chattanooga, Tenn.
George Manuell, *M. M* ...Chattanooga, Tenn.
Fred Morgan, *M. C. B* ...Chattanooga, Tenn.
V. & M. Div.: E. F. Raworth, *G. S.* Vicksburg, Miss
James B. Browne, *M. M* ...Vicksburg, Miss.
V. S. & P. Div.: F. Y. Dabney, *Supt*..Monroe, La.
W. Bell Smith, *M. M. & C. B* ...Monroe, La.
Cincinnati Northern Ry. 3 g. 30 m. 4 lo. 60 c.
G. L. Barringer, *Gen. Man* ...Cincinnati, O.
C. W. Bradley, *Pur. Agt* ...Cincinnati, O.
T. J. Hamer, *M. M. & C. B* ...Cincinnati O.
Cincinnati, Selma & Mobile R.R. 5 g. 45 m. 2 lo. 39 c.
A. M. Fowlkes, *Supt* ...Selma, Ala.
Simon Hertz, *Pur. Agt* ...Selma, Ala.
J. M. Levis, *M. M* ...Marion, Ga.
Cincinnati & South-Eastern Ry. 3 g. 17 m.
G. H. Wilber, *Gen. Supt* ...Cincinnati, O.
John V. Patton, *Gen. Man* ...Newport, Ky.
Cincinnati Southern Ry. (*See Cin., N. O. & Tex. Pac.*)
Cincinnati, Van Wert & Mich. R. R. 4-8½ g. 22 m.
R. J. Cavett, *Supt* ...Van Wert, O.
Cin., Wabash & Mich. Ry. 4-8½ g. 110 m. 8 lo. 139 c.
Norman Beckley, *Gen. Man. & P. A.* Elkhart, Ind.
O. W. Lamport, *Supt* ...Wabash, Ind.
S. B. Tinker, *M. M. & M. C. B*...Wabash, Ind.
Cincinnati & Eastern Ry. 3 g. 76 m. 4 lo. 66 cars.
P. W. Naughton, *M. M* ...Cincinnati, O.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 2 lo. 21 cars.
A. H. Kunst, *Supt* ...Weston, W. Va.
Sam. A. Steel, *M. M* ...Weston, W. Va.
F. Dillie, *M. C. B* ...Nottingham, O.
Cleve., Akron & Col. R. R. 4-9 g. 144 m. 14 lo. 638 c.
N. Monsarrat, *Gen. Supt* ...Akron, O.
M. M. & C. B ...Akron, O.

Cleve., Col., Cin. & Ind. Ry:
Cin., Ham. & Dayton and Ind. & St. Louis.
4-8½ g. 812 m. 246 lo. 7,082 cars.
J. H. Devereux, *Pres* ...Cleveland, O.
E. B. Thomas, *Gen. Man* ...Cleveland, O.
J. L. Yale, *Pur. Agt* ...Cleveland, O.
W. F. Turreff, *Gen. M. M* ...Cleveland, O.
(1) Cl., Col., Cin. & Ind. Divs. 471 m. 162 lo. 4,768 c.
Col. & Cin. Div.: Robt. Blee, *Supt* .Cleveland, O.
W. L. Gilmore, *M. M* ...Cleveland, O.
A. G. Steinbrenner, *G. For. Car Dept.* do.
Ind'p'lis Div.: C. C. Gale, *Supt.* Indianapolis, Ind.
Jas. Eckford, *M. M* ...Brightwood, Ind.
N. Mark, *G. For. Car Dept.* Brightwood, Ind.
Day. & Union: H. S. Gordon, *M. M*...Dayton, O.
(2) Cin., Ham. & Day. Divs. 341 m. 84 lo. 2,314 c.
J. H. Barrett, *Gen. Supt* ...Cincinnati, O.
D. S. Cross, *M. M* ...Cincinnati, O.
W. H. H. Allison, *G. For. Car Dept.* do.
C. R. & C. Div.: W. S. Brewer, *M. M.* Richm'd, Ind.
D. & M. Rd.: J. H. Barrett, *Supt* ...Toledo, O.
Jno. Black, *M. M* ...Lima, Ohio.
Cleve., Painesv'le & Ash. 4-8½ g. 11 m. 3 lo. 22 cars.
Wm. E. Lewis, *Gen. Man* ...Cleveland, O.
F. Dillie, *M. C. B* ...Nottingham, O.
Cleveland & Pittsburg R. R. (*See Penna. Co.*)
Cleveland, Tuscarawas Valley & Wheeling Ry.
4-8½ g. 158 m. 23 lo. 1,522 cars.
Oscar Townsend, *Gen. Man* ...Cleveland, O.
Wm. Thornburg, *Supt* ...Cleveland, O.
W. A. Stone, *M. M* ...Lorain, O.
Cleve. & Marietta R. R. 4-8½ g. 99 m. 9 lo. 157 cars.
S. C. Baldwin, *Gen. Man* ...Marietta, O.
R. B. Hoover, *Pur. Agt* ...Marietta, O.
E. C. Hill, *M. M* ...Marietta, O.

Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 207 cars.
Jas. R. Barber, *Gen. Supt*.....Cobourg, Ont.
Jas. Clark, *M. M*.....Cobourg, Ont.
John Tinney, *M. C. B*.....Cobourg, Ont.
Columbia & Greenville R. R. (*See Rich. & Dan.*)
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 319 m. 76 lo. 6,000 cars.
Orland Smith, *Gen Man*.....Columbus, O.
G. R. Carr, *Gen. Supt. & Pur. Agt*. Columbus, O.
J. G. Hutchins, *M. M*.....Columbus, O.
J. M. Rockafield, *M. C. B*.....Columbus, O.
Tol. Div.: M. T. Seymour, *Supt*.....Columbus, O.
Hock. V. Div.: M. P. L. Booth, *Supt*. Columbus, O.
Ohio Riv. Div.: C. D. Norris, *Supt*.....Logan, O.
Columbus & Maysville Ry. (*See Cin. & East.*)
Columbus & Rome R. R. 3 g. 32 m. 2 lo. 25 cars.
M. E. Gray, *Supt*.....Columbus, O.
Columbus & Western Ry. 5 g. 80 m. 2 lo. 19 cars.
E. A. Llewellen, *Gen. Man*.....Columbus, Ga.
R. A. Bridges, *M. M*.....Opelika, Ala.
Concord & Claremont R. R. (*See Northern of N. H.*)
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 33 lo. 456 c.
J. Mulligan, *Supt. & Pur. Agt*. Springfield, Mass.
W. H. Stearns, *M. M*.....Springfield, Mass.
Robert Hitchcock, *M. C. B*...Springfield, Mass.
Connotton Valley R. R. 3 g. 109 m. 10 lo. 531 cars.
W. W. Hungerford, *Gen. Man*.....Canton, O.
W. N. Moffet, *Supt*.....Canton, O.
A. B. Proal, *Pur. Agt*.....Canton, O.
E. W. Poorman, *M. M*.....Canton, O.
Cooperstown & Susq. Val. 4-8½ g. 16 m. 2 lo. 13 cars.
Andrew Shaw, *Pres*.....Cooperstown, N. Y.
Alonzo Mumford, *M. M*.....Cooperstown, N. Y.
Corning, Cowanasque & An. Ry (*See Syr., G. & C.*)
Cornwall R. R., 4-8½ g. 9 m 5 lo. 166 cars.
Frank Donahue, *G. Supt. & M. M*. Lebanon, Pa.
Levi Bloneh, *M. C. B*.....Lebanon, Pa.
Cotton Plant R. R. 5-6 g. 11 m.
Wm. Black, *Pres. & Gen. Man*. Brinkley, Ark.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 484 cars.
James Ross, *Gen. Supt*.....Toronto, Ont.
John Macnab, *Pur. Agt*.....Toronto, Can.
H. G. Taylor, *Mech. Supt*.....Toronto, Can.
Crown Point Iron Co. R. R. 3 g. 13 m.
A. L. Inman, *Gen. Man*.....Plattsburg, N. Y.
J. M. Davies, *Supt. & M. M*. Crown Point, N. Y.
J. C. Sherman, *M. C. B*.....Crown Point, N. Y.
Cumberland & Maurice Riv. R. R. 4-8½ g. 22 m.
L. H. Dowdney, *Supt*.....Port Norris, N. J.
Cumberland & Pennsylvania R. R. 4-8½ g. 55 m.
P. L. Burwell, *Gen Supt & P A*. Cumberland, Md.
N. W. Howson, *Mast. of Mach*. Mt. Savage, Md.
Nathan Binix, *M. C. B*.....Mt. Savage, Md.
Cumberland Valley R. R. 4-9 g. 125 m. 21 lo. 280 cars.
J. F. Boyd, *Supt*.....Chambersburg, Pa.
A. S. Hull, *M. M*.....Chambersburg, Pa.
C. Wickey, *F. C. R*.....Chambersburg, Pa.

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Danbury & Norwalk R. R. 4-8½ g. 33 m. 6 lo. 100 c.
L. W. Sandiforth, *G. Supt. & P. A*. S. Norwalk, Ct.
N. M. George, *M. M. & C. B*.....Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. W. Goodrich, *Ch. Eng*.....Leakesville, N. C.
Danville, Olney & O. R. R.R. 4-8½ g. 110 m. 4 lo. 83 c.
C. Howard, *G. Man. & Pur. Agt*. Boston, Mass.
J. M. Graham, *Supt*.....Kansas, Ill.
Louis Parisoe, *M. M & C. B*.....Kansas, Ill.
Dayton & Union R. R. (*See Ohio Ry.*)
Delaware, Lackawanna & Western R. R.
4-8½ g. 670 m. 348 lo. 26,187 cars.
Wm. F. Halstead, *Gen. Supt*.....Scranton, Pa.
G. W. B. Cushing, *Pur. Agt*.....New York, N. Y.
Walter Dawson, *Mast. of Mach*...Scranton, Pa.
Robt. McKenna, *M. C. B*.....Scranton, Pa.
Bloomsb'g Div.: C. Graham, *M. M*. Kingston, Pa.
Utica Div.: A. C. Salisbury, *Supt*.....Utica, N. Y.
Thos. Thatcher, *M. M*.....Utica, N. Y.
Morris & Essex Div. and Sussex R. R.:
A. Reasoner, *Supt*.....Hoboken, N. J.
W. H. Lewis, *M. M*.....Kingsland, N. J.
J. W. Baker, *Mast. Car Rep*.....Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt*.....Oswego, N. Y.
Jas. Buchanan, *M. M*.....Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, *Gen. Supt*.....Syracuse, N. Y.
Jas. Buchanan, *M. M*.....Syracuse, N. Y.
Delaware River R. R. 4-9 g. 20 m. 3 lo. 4 cars.
E. H. Green, *Supt. & P. A*...Pedricktown, N. J.
Delaware Western R. R. 4-8½ g. 20 m. 4 lo. 30 cars.
David Connell, *Supt*.....Wilmington, Del.
Delaware & Chesapeake R. R. 4-8½ g. 54 m. 3 lo. 16 c.
O. S. Sanford, *Supt*.....Oxford, Md.
Joseph A. Baynard, *M. M*.....Oxford, Md.
Chas. E. Mason, *M. C. B*.....Oxford, Md.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 596 m. 151 lo. 9,248 cars.
C. F. Young, *Gen. Man*.....Honesdale, Pa.
C. F. Young, *Pur. Agt*.....Albany, N. Y.
R. C. Blackall, *Supt. of Mach*.....Albany, N. Y.
Susq. Div.: C. D. Hammond, *Supt*. Albany, N. Y.
C. A. Jones, *M. M*.....Oneonta, N. Y.
J. R. Skinner, *M. C. B*.....Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt*...Troy, N. Y.
J. L. Corey, *M. M*.....Green Island, N. Y.
Chr. Körner, *M. C. B*.....Green Island, N. Y.
Pa. Div.: R. Manville, *Supt. & Pur. Agt.*; and
S. H. Dotterer, *M. M*.....Carbondale, Pa.
T. Orchard, *M. C. B*.....Carbondale, Pa.
Denver & Rio Grande Ry. 3 g. 1,062 m. 170 lo. 4,617 c.
D. C. Dodge, *Gen. Man*.....Denver, Col.
Geo. W. Ristine, *Asst. Gen. Man*...Denver, Col.
A. B. Garner, *Pur. Agt*..Colorado Springs, Col.
N. W. Sample, *M. M*.....Denver, Col.
Frank Howard, *M. C. B*.....Burnham, Col.
1st Div.: M. C. Kimberly, *Supt*.....S. Pueblo, Col.
2d Div.: W. H. Bancroft, *Supt*.....Alamosa, Col.
Gun'n Div.: J. A. Myers, *Supt*.....Salida, Col.
B. & E. Riv. Div.: C. Lydon, *Supt*..Leadville, Col.
San J. Div.: R. M. Ridgeway, *Supt*..Antonito, Col.
Des Moines & Ft. Dodge. 4-8½ g. 87 m. 11 lo. 158 c.
C. N. Gilmore, *Supt*.....Des Moines, Ia.
John McGrayel, *M. M*.....Grand Junction, Ia.
E. A. Avery, *M. C. B*.....Grand Junction, Ia.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 36 lo. 478 c.
G. R. Nash, *Asst. Man*.....Detroit, Mich.
John S. Lorimer, *Storekeeper*.....Detroit, Mich.
W. J. Morgan, *Supt*.....Detroit, Mich.
F. Parker, *Mech. Supt*.....Detroit, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c.
John B. Mulliken, *Gen. Man*.....Detroit, Mich.
Allan Bourn, *Pur. Agt*.....Detroit, Mich.
Thos. M. Fish, *Gen. Supt*.....Ionia, Mich.
G. C. Watrous, *M. M. & C. B*.....Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 151 m. 8 lo. 227 c.
Thos. McKeown, *Gen. Supt*...Marquette, Mich.
E. W. Allen, *Pur. Agt*.....Marquette, Mich.
John Wilson, *Mech. Supt*.....Marquette, Mich.
Dorchester & Delaware R. R. 4-8½ g. 33 m.
Thos. E. Wright, *Supt*.....Cambridge, Md.
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, *Supt*.....Waverly, Ia.
W. S. Couch, *Pur. Agt*.....Dubuque, Ia.
Duck River Valley R. R. 3 g. 34 m.
Geo. Childress, *Supt*.....Columbia, Tenn.
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, *Gen. Supt*.....Dunkirk, N. Y.
R. C. Moore, *Pur. Agt*.....New York, N. Y.
J. C. Haggett, *M. M. & C. B*.....Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 12 cars.
W. W. Barnes, *Supt*.....Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 6 lo. 191 cars.
A. W. Sims, *Supt*.....Orbisonia, Pa.
G. A. Haggerty, *M. M*.....Orbisonia, Pa.
E. St. Louis & Carondelet Ry. 4-9 g. 12 m. 1 lo. 22 c.
Joseph Hill, *Gen. Supt*.....East St. Louis, Mo.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,185 m. 133 lo. 1,597 cars.
Henry Fink, *Gen. Man*.....Lynchburg, Va.
J. F. O'Brien, *Gen. Supt*.....Knoxville, Tenn.
Main Stem; Ohio; and No. Car. Divs.:
F. K. Huger, *Supt*.....Knoxville, Tenn.
B. J. Sitton, *M. M*.....Knoxville, Tenn.
Jos. Armbruster, *M. C. B*.....Knoxville, Tenn.

Selma and Alabama Central Divs.:
John M. Bridges, *Supt*.....Selma, Ala.
Simon Gay, *M. M*.....Selma, Ala.
W. W. Pierce, *M. C. B*.....Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., *Supt*.....Memphis, Tenn.
H. N. Burford, *M. M*.....Memphis, Tenn.
J. J. Casey, *M. C. B*.....Memphis, Tenn.
Macon & Brunswick Div.:
J. F. Mallory, *Supt*.....Macon, Ga.
G. R. Wagnon, *M. M*.....Macon, Ga.
East Tenn. & W'n No. Car. R. R. 3 g. 15 m. 2 lo. 36 c.
Thomas E. Matson, *Supt*...Elizabethton, Tenn.
Eastern R. R. 4-8½ g. 283 m. 99 lo. 2,268 cars.
D. W. Sanborn, *Mast. of Trans*..Boston, Mass.
Geo. J. Fisher, *Pur. Agt*.....Boston, Mass.
Amos Pillsbury, *S. M. P. & M*...E. Boston, Mass.
J. D. Billings, *M. C. B*.....Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt*., Wolfboro J., N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 123 c.
H. W. Bates, *V. P. & Manager*...Greenup, Ky.
Geo. Gibbs, *Pur. Agt*.....Riverton, Ky.
D. S. Weaver, *M. M*.....Riverton, Ky.
Eastern Maine R. R. 3 g. 18 m. 2 lo. 35 cars.
L. L. Lincoln, *Supt*.....Bucksport, Me.
Eastern Ohio R. R. 4-8½ g. 8 m. 1 lo. 2 cars.
W. H. Stevens, *Gen. Supt*.....Cumberland, O.
Eastern Shore R. R. 4-8½ g. 38 m. 2 lo.
W. Thompson, *Supt*.....Princess Anne, Md.
F. Strattner, *M. M*.....Princess Anne, Md.
Elberton Air-Line R. R. (*See Rich. & Dan. N. G. Br.*)
Elgin Ry. 14 miles.
C. E. Hallett, *Gen. Man*.....Sussex, N. B.
Elizabeth City & Norfolk R. R. 4-8½ g. 79 m. 5 lo. 96 c.
M. K. King, *Gen. Man. & Pur. Agt*. Norfolk, Va.
J. S. Whitworth, *M. M. & C. B*.....Norfolk, Va.
Erie & Pittsburgh R. R. (*See Penna. Co.*)
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 124 cars.
P. Everts, *Gen. Supt & Pur. Agt*..Eureka, Nev.
J. P. Rugg, *M. M*.....Palisade, Nev.
A. S. Longley, *M. C. B*.....Palisade, Nev.
Europ. & No. Amer. Ry. 4-8½ g. 114 m. 15 lo. 557 c.
F. W. Cram, *Supt. & Pur. Agt*.....Bangor, Me.
A. O. Bailey, *M. M. & C. B*. Mattawamkeag, Me.
Evansville, Paducah & Cairo Line. 200 miles.
G. J. Grammer, *Supt*.....Evansville, Ind.
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, *Supt*.....Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 114 m. 26 lo. 900 c.
C. J. Hepburn, *Gen. Supt*.....Evansville, Ind.
John Torrence, *Gen. For*.....Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 189 m. 100 lo. 3,315 cars.
John Adams, *Gen. Supt*.....Boston, Mass.
E. K. Turner, *Asst. Supt*.....Fitchburg, Mass.
F. S. Pratt, *Pur. Agt*.....Boston, Mass.
W. A. Foster, *Acting Supt. M. P. & M.*; and
J. W. Marden, *M. C. B*.....Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 318 m. 52 lo. 1,556 cars.
H. C. Potter, *Gen. Man*.....E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man*..E. Saginaw, Mich.
G. G. Cook, *Pur. Agt*.....E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt*..E. Saginaw, Mich.
W. F. Potter, *Supt.* (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, *Supt.* (W. Div.) E. Saginaw, Mich.
T. J. Hatswell, *M. M*.....E. Saginaw, Mich.
R. McPherson, *M. C. B*.....E. Saginaw, Mich.
Florida Central & Western R. R.
5 g. 234 m. 16 lo. 160 cars.
Wm. M. Davidson, *Gen. Man*. Jacksonville, Fla.
J. P. Laird, *Supt*.....Tallahassee, Fla.
Jas. S. McElroy, *M. M. & C. B*. Jacksonville, Fla.
Florida Southern Ry. 3 g. 50 m. 5 lo. 53 cars.
N. R. Gruelle, *Gen. Supt*.....Palatka, Fla.
F. A. Garrison, *Pur. Agt*.....Palatka, Fla.
J. W. Roberts, *M. M. & C. B*.....Palatka, Fla.
Florida Transit R. R. 5 g. 224 m.
D. E. Maxwell, *Gen. Supt*.....Fernandina, Fla.
John Hedges, *Pur. Agt*.....Fernandina, Fla.
J. V. Webster, *M. M*.....Fernandina, Fla.
G. Hernandez, *M. C. B*.....Fernandina, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 18 c.
Lawton Caten, *Supt*.....Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A*. Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. 4-8½ g.
G. R. Pearson, *Supt*.....Fort Dodge, Ia.
Ft. Madison & No.-West'n Ry. 3 g. 41 m. 4 lo. 120 c.
S. B. Kenrick, *Supt. & Pur. Agt*. Ft. Madison, Ia.
L. Lamb, *M. M. & C. B*.....Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 108 m. 9 lo. 249 c.
White Water R. R. 4-8½ g. 62 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt*. Ft. Wayne, Ind.
W. D. Morris, *M. M. & C. B*...Ft. Wayne, Ind.
Ft. Wayne & Jackson. 4-8½ g. 100 m. 10 lo. 353 c.
Gen. Supt. & P. A.....Jackson, Mich.
C. W. Hollister *M. M. & C. B*.....Jackson, Mich.
Frederickton Ry. 4-8½ g. 22 m. 2 lo. 22 cars.
F. B. Edgecomb, *Supt*.....Frederickton, N. B.
Freehold & New York Ry. 4-9 g. 15 m. 3 lo. 40 c.
J. E. Ralph, *Supt., P. A. & M. M*. Keyport, N. J.
Chas. H. Snedeker, *M. C. B*.....Freehold, N. J.
Fulton County N. G. Ry. 3 g. 47 m. 2 lo. 106 cars.
A. C. Atherton, *Gen. Supt. & P. Agt*. Lewiston, Ill.

G

Galveston, Harrisburg & San Antonio Ry.
4-8½ g. 492 m. 47 lo. 1870 cars.
Jas. Converse, *Gen. Supt*.....Houston, Tex.
Chas. Babbidge, *Pur. Agt*.....Boston, Mass.
D. T. Davis, *Supt. M. P. & M*..Harrisburg, Tex.
James Alexander, *M. C. B*.....Harrisburg, Tex.
El Paso Div. (*See Cen. Pac.*) 4-8½ g. 144 miles.
Galveston, Houston & Henderson R. R.
4-8½ g. 50 m. 17 lo. 212 cars.
W. H. Harding, *G. Man. & P. Agt*. Galveston, Tex.
Allen McCoy, *Supt*.....Galveston, Tex.
J. G. Conlon, *M. M*.....Galveston, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
Georgia R. R. 5 g. 307 m. 42 lo. 938 cars.
John W. Green, *Gen. Man*.....Augusta, Ga.
John S. Cook, *M. M*.....Augusta, Ga.
T. M. Preval, *M. C. B*.....Augusta, Ga.
Georgia Pacific Ry. (Miss. Div.). 3 g. 43 m. 2 lo. 44 c.
C. M. Bolton, *Supt*.....Greenville, Miss.
W. M. Sutton, *Pur. Agt*.....Greenville, Miss.
Benj. Davis, *M. M*.....Greenville, Miss.
J. B. Shelton, *M. C. B*.....Greenville, Miss.
Grand Haven R. R. (*See Chic. & W. Mich.*)
Grand Junction R'y. (*See Midland of Can.*)
G'd Rap., Newaygo & L. S. R. R. (*See Chic. & W. M.*)
Grand Rapids & Indiana. 4-8½ g. 456 m. 46 lo. 1,566 c.
W. O. Hughart, *Gen. Man*. Grand Rapids, Mich.
W. R. Shelby, *Pur. Agt*.....Grand Rapids, Mich.
S. D. Bradley, *M. M*.....Grand Rapids, Mich.
No'n Div.: J. M. Metheany, *Supt*. G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, *Supt*. Fort Wayne, Ind.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, *Supt. & P. A*..Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B*.....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 1,267 m. 434 lo. 9,403 c.
Joseph Hickson, *Gen. Man*.....Montreal, Can.
Wm. Wainright, *Asst. Gen. Man*. Montreal, Can.
Gr. Tr. Divs.: W. J. Spicer, *Supt*. Montreal, Can.
Jno. Taylor, *Gen. Storekeeper*. Montreal, Can.
Herbert Wallis, *Mech. Supt*...Montreal, Can.
Wm. McWood, *M. C. B*.....Montreal, Can.
F. R. F. Brown, *Asst. M. S*.....Montreal, Can.
J. Davis Barnett, *Asst. M. S*...Stratford, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 330 m. 56 lo. 1,191 c.
S. R. Callaway, *Gen. Man*.....Chicago, Ill.
W. H. Pettibone, *Supt*...Battle Creek, Mich.
N. Wall, *Pur. Agt*.....Fort Gratiot, Mich.
H. Roberts, *Mech. Supt*.....Port Huron, Mich.
Great Western Ry. 4-8½ g. 823 m. 216 lo. 5,039 c.
F. Broughton, *Gen. Man*.....Hamilton, Ont.
Chas. Stiff, *Asst. Gen. Man*.....Hamilton, Ont.
John Burton, *Supt*.....Hamilton, Ont.
E. R. Baines, *Pur. Agt*.....Hamilton, Ont.
C. K. Domville, *Loco. Supt*.....Hamilton, Ont.
C. F. Hanson, *M. M*.....London, Ont.
Henry Childs, *Car Supt*.....London, Ont.
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 599 cars.
Timothy Case, *V. P., Gen. Man*. Green Bay, Wis.
James S. Mott, *Pur. Agt*.....Green Bay, Wis.
Edw. Osborne, *M. M*.....Ft. Howard, Wis.
Greenwich & Johnsonville Ry. 4-8½ g. 15 miles.
J. H. Thompson, *Supt*.....Greenwich, N. Y.

Gulf, Col. & Santa Fé Ry. 4-8½ g. 400 m. 32 lo. 1,000 c.
John Sealy, *Gen. Man*.....Galveston, Texas.
F. P. Killeen, *Asst. Gen. Man. & Pur. Agt*. do.
G. B. Nichols, *M. M*.....Galveston, Texas.
W. H. Martin, *M. C. B*.....Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 70 c.
M. D. Monserrate, *Pr. & Supt*.....Cuero, Texas.
James Mooney, *M. M*.....Cuero, Texas.

H

Halifax & Cape Breton Ry. 4-8½ g. 79 m. 5 lo. 237 c.
H. Abbott, *Manager*.....New Glasgow, N. S.
Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,860 c.
John B. Carson, *Gen. Man*.....Hannibal, Mo.
W. R. Woodard, *Supt*.....Hannibal, Mo.
T. L. Dunn, *Ch. Eng. & Pur. Agt*..Hannibal, Mo.
Jas. Long, *Supt. M. P. & Car Dep*. Hannibal, Mo.
Hanover Branch Ry. 4-8½ g. 8 m. 2 lo. 18 cars.
E. Y. Perry, *Pres*.....So. Hanover, Mass.
E. A. Josselyn, *M. M*.....So. Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 9 lo. 106 cars.
H. A. Young, *Gen. Supt*.....Hanover, Pa.
John J. Bingley *M. M*.....Hanover, Pa.
Henry Britcher, *M. C. B*.....Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 27 m. 2 lo. 7 c.
R. H. Middleton, *Supt*.....Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 45 m. 7 lo. 196 c.
Samuel Babcock, *Pr. & Supt*.....Hartford, Ct.
S. E. Brewer, *M. M*.....Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 69 m. 10 lo. 235 c.
John F. Jones, *Supt*.....Hartford, Ct.
J. C. Barton, *M. M*.....Hartford, Ct.
Housatonic R. R. 4-8½ g. 126 m. 22 lo. 495 cars.
Supt.....Bridgeport, Ct.
D. S. Draper, *Pur. Agt*.....Bridgeport, Ct.
N. Slingland, *M. M*.....Falls Village, Ct.
J. J. Ferris, *M. C. B*.....Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 50 miles.
S. L. Werden, *V. P. & Gen. Man*. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 109 m. 6 lo. 224 c.
Paul Bremond, *Pr. & Pur. Agt*..Houston, Tex.
E. L. Bremond, *Gen. Man*.....Houston, Tex.
A. Riggs, *M. M*.....Houston, Tex.
Houston & Tex. Cen. Ry. 4-8½ g. 701 m. 78 lo. 2,526 c.
G. Jordan, *V. Pr. & Gen. Man*.....Houston, Tex.
A. H. Swanson, *Gen. Supt*.....Houston, Tex.
E. S. Larchar, *Pur. Agt*.....New York, N. Y.
L. C. Noble, *Gen. M. M*.....Houston, Tex.
James McGee, *M. C. B*.....Houston, Tex.
So. & Wn. Divs.: M. G. Howe, *Supt*. Houston, Tex.
No. & Mi. Divs.: G. A. Quinlan, *Supt*., and
C. H. Burns, *Asst. M. M*.....Corsicana, Tex.
No.-Wn. Div.: Donald Allen, *Supt*.....Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 85 m. 5 lo. 72 cars.
F. O. Wyatt, *Gen. Man*.....Clarinda, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, *Gen. Supt*.....Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt*..Philadelphia, Pa.
William Barkla, *M. M*.....Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,554 m. 224 lo. 6,172 c.
E. T. Jeffery, *Gen. Supt*.....Chicago, Ill.
C. A. Beck, *Asst. Gen. Supt*.....Chicago, Ill.
O. Ott, *Pur. Agt*.....Chicago, Ill.
S. J. Hayes, *Supt. of Mach*.....Chicago, Ill.
W. B. Snow, *M. M. Car Works*.....Chicago, Ill.
Chic. Div.: T. J. Hudson, *Supt*.....Cairo, Ill.
Henry Schlacks, *M. M*.....Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt*.....Pontiac, Ill.
Spring. Div.: W. Wilkinson, *Supt*. Springfield, Ill.
W. B. McKenna, *M. M*.....Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt*.....Amboy, Ill.
J. B. Edams, *M. M*.....Amboy, Ill.
So. Div.: David Oxley, *M. M*.....Centralia, Ill.
J. J. Giles, *M. C. B*.....Centralia, Ill.
Ia. Div.: D. W. Parker, *Supt*.....Dubuque, Ia.
Thos. W. Place, *M. M*.....Waterloo, Ia.
South Div.: David Oxley, *M. M*.....Centralia, Ill.
J. J. Giles, *M. C. B*.....Centralia, Ill.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, *Rec. & Gen. Man*. Terre Haute, Ind.
E. D. Frost, *Gen. Supt*.....Terre Haute, Ind.
J. G. Clifford, *M. M*.....Terre Haute, Ind.
Illinois & St. Louis R. R. 4-8½ g. 18 m. 5 lo. 402 c.
C. H. Sharman, *Gen. Supt. & P. A*. Belleville, Ill.
E. Hockett, *M. M*.....Belleville, Ill.
Charles Rotha, *M. C. B*.....E. St. Louis, Ill.
Indiana, Bloomington & Western Ry.
4-8¾ g. 712 m. 64 lo. 3,650 cars.
C. E. Henderson, *Gen. Man*. Indianapolis, Ind.
H. C. Norton, *Pur. Agt*.....Indianapolis, Ind.
B. Warren, *Gen. M. M*.....Indianapolis, Ind.
Peoria Div.: I. H. Wilson, *Supt*..Indianapolis, Ind.
E. Hiserodt, *M. M*.....Urbana, Ill.
St. Louis Div.: I. H. Wilson, *Supt*.....Indnpls, Ind.
John King, *M. M*.....Indianapolis, Ind.
Ohio Div.: D. W. C. Brown, *Supt*.....Sandusky, O.
Jos. S. Porter, *M. M*.....Sandusky, O.
Indiana, Illinois & Iowa R. R. 42 miles.
F. M. Drake, *Gen. Man*.....Dwight, Ill.
J. P. Shouts, *Supt*.....Dwight, Ill.
Ind'p'lis & St. Louis R. R. 266 m. 56 lo. 2,276 c.
C. C. Gale, *Gen. Supt*.....Indianapolis, Ind.
J. L. Yale, *Pur. Agt*.....Cleveland, O.
T. W. Ransom, *M. M. & C. B*.....Mattoon, Ill.
Indianapolis & Vincennes R. R. (*See Penna. Co.*)
Intercolonial Ry. 4-8½ g. 846 m. 111 lo. 3,223 cars.
David Pottinger, *Chief Supt*.....Moncton, N. B.
T. V. Cooke, *Gen. Storekeeper*..Moncton, N. B.
H. A. Whitney, *Mech Supt*.....Moncton, N. B.
Ewd. Shaffer, *M. C. B*.....Moncton, N. B.
Monc. Div.: James E. Price, *Supt*. Moncton, N. B.
Hal. & St. J. Div.: Jas. Coleman, *Supt*..Truro, N. B.
No'n Div.: M. Busby, *Supt*.....Cambellton, N. B.
Levis Div.: M. McDonald, *Supt*. Rivière du Loup, Q.
International Ry. 4-8½ g. 69 m. 2 lo. 12 cars.
D. E. McFee, *Supt*.....Sherbrooke, Que.
International & Gt. N'n R. R. (*See St. L., I. M. & S.*)
Iowa Eastern R. R. 3 g. 19 m. 1 lo. 32 cars.
H. H. Kerr, *Supt*.....Beulah, Ia.
Iron R. R. 4-10 g. 16 m. 5 lo. 187 cars.
C. C. Clark, *Gen. Man*.....Ironton, O.
Perry Scott, *M. M*.....Ironton, O.
Clem. Roetling, *M. C. B*.....Ironton, O.
Iron Mountain & Helena R. R. 4-8½ g. 27 m. 2 lo. 11 c.
Wm. Bailey, *Pres. & Gen. Man*...Helena, Ark.
D. Stillinger, *Supt*.....Helena, Ark.
F. M. Green, *Pur. Agt*.....Helena, Ark.
Wm. Summers, *M. C. B*.....Helena, Ark.
Ithaca, Auburn & Western R. R. 4-8½ g. 38 m.
Fred T. Peet, *Supt*.....Auburn, N. Y.
Ira Dunning, *M. M*.....Auburn, N. Y.

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 68 c.
E. S. Greenleaf, *Supt*.....Jacksonville, Ill.
Ira Petrie, *M. M*.....Jacksonville, Ill.
Jacksonv., Pensacola & Mob. (*See Fla. Cent. & W.*)
Jamesville & Washington. 4-8½ g. 22 m. 3 lo. 24 c.
A. Fisher, *Manager*.....Dymond City, N. C.
J. E. Lordley, *M. M. & C. B*..Dymond City, N. C.
Jeffersonv'l, Madison & Indpls. R. R. (*See Pa. Co.*)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, *Manager*...Jersey City, N. J.
Junction & Breakwater; Breakwater & Frankford;
and Worcester R. Rs. 4-8½ g. 101 m. 6 l. 133 c.
J. & B. Rd.: Thos. Groome, *Supt*.....Lewes, Del.
Geo. Messick, *M. M*.....Lewes, Del.
W. H. Virden, *M. C. B*.....Lewes, Del.
B. & F. and W. Rds.: J. L. Mapes, *St*. Berlin, Md.

K

Kansas Central R. R. (*See Union Pacific.*)
Kansas City, Fort Scott & Gulf R. R.; and
Kansas City, Lawrence & Southern Kansas R. Rs.
4-8½ g. 729 m. 62 lo. 1,700 cars.
Geo. H. Nettleton, *Gen. Man*..Kansas City, Mo.
L. W. Towne, *Gen. Supt*.....Kansas City, Mo.
H. P. Jacques, *Pur. Agt*.....Kansas City, Mo.
J. L. Barnes, *Supt*.....Kansas City, Mo.
J. S. McCrum, *M. M*.....Kansas City, Mo.
A. N. Montier, *M. C. B*.....Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. &
Des Moines R. Rs. 4-8½ g. 368m. 38 lo. 1,148 cars.
J. F. Barnard, *Gen. Supt. & P. A*. St. Joseph, Mo.
F. A. Chase, *M. M*.....St. Joseph, Mo.
Thos. Aylesbury, *M. C. B*.....St. Joseph, Mo.
Kendall & Eldred R. R. (*See Olean, B. & W.*)

Kent Co.; Sm. & Del. Bay Rds. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, *Gen. Man*.....Chestertown, Md.
Kentucky Central R. R. 5 g. 148 m. 19 lo. 371 cars.
J. D. Ellison, *Gen. Man*.....Covington, Ky.
J. H. Setchel, *Supt. of Trans. & Mo. Po*.. do.
F. Allingham, *M. M*.....Covington, Ky.
J. L. Hackathorn, *M. C. B*.....Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, *Supt. & P. A*..Mt. Sterling, Ky.
S. P. Hatfield, *M. M*.....Mt. Sterling, Ky.
Kinzua R. R. (*See Olean, B. & W.*)
Kingston & Pembroke Ry. 4-8½ g. 65 m. 4 lo. 76 c.
B. W. Folger, *Supt*.....Kingston, Ont.
Wm. Harty, *Pur. Agt*.....Kingston, Ont.
Geo. Becker, *M. M*.....Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 96 cars.
C. A. Coombs, *Supt*.....Bath, Me.
Wm. A. Field, *M. M*.....Bath, Me.
C. L. Turner, *M. C. B*.....Bath, Me.
Knoxville & Augusta R. R. 4-6 g. 16 m. 2 lo. 34 cars.
J. M. Hood, *Supt*.....Marysville, Tenn.
M. R. Hood, *Pur. Agt*.....Marysville, Tenn.

L

Lake Erie & Western Ry. 4-8½ g. 362 m. 35 l. 1,526 c.
E. H. Waldron, *Gen. Man*.....La Fayette, Ind.
E. H. Andress, *Pur. Agt*.....La Fayette, Ind.
H. L. Cooper, *Supt. of Equipment*.....Lima, O.
Sandusky Div.: D. S. Hill, *Supt*.....Fremont, O.
Bloom. Div.: *Supt*...La Fayette, Ind.
Lake George & Muskegon Riv. 4-8½ g. 21 m. 4 lo. 75 c.
W. S. Gerrish, *Gen. Man*.....Muskegon, Mich.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,243 m. 537 lo. 16,018 cars.
John Newell, *Gen. Man*.....Chicago, Ill.
P. P. Wright, *Gen. Supt*.....Cleveland, O.
A. C. Armstrong, *Pur. Agt*.....Cleveland, O.
James Sedgley, *Gen. M. M*.....Cleveland, O.
John Kirby, *Gen. M. C. B*.....Cleveland, O.
Buffalo Div.: C. B. Couch, *Supt*.....Cleveland, O.
J. S. Graham, *M. M*.....Buffalo, N. Y.
A. C. Robson, *M. C. B*.....Buffalo, N. Y.
Frank. Div.: G. H. McIntire, *Supt*..Stoneboro, Pa.
Erie Div.: C. B. Couch, *Supt*.....Cleveland, O.
L. O. Gassett, *M. M*.....Cleveland, O.
J. Withycombe, *M. C. B*.....Cleveland, O.
Toledo Div.: Thos. Flesher, Jr., *Supt*. Cleveland, O.
J. M. Sanborn, *M. M*.....Norwalk, O.
W. O. Smith, *M. C. B*.....Norwalk, O.
Mich. Div.: J. E. Curtis, *Supt*.....Toledo, O.
Det. Div.: T. J. Charlesworth, *Supt*. Detroit, Mich.
Lansing Div.: W. H. Caniff, *Supt*..Lansing, Mich.
Western Div.: J. H. Parsons, *Supt*...Chicago, Ill.
G. W. Stevens, *M. M.* (M. S. Divs.) Elkhart, Ind.
Frank O. Bray, *M. C. B*.....Adrian, Mich.
Laurel Fork & Sand Hill R. R. 4-8½ g. 6 m. 2 lo. 4 c.
M. C. C. Church, *Supt*...Parkersburg, W. Va.
Lebanon Springs R. R. 4-8½ g.
W. C. Alstyne, *Manager*.....Albany, N. Y.
J. K. Hotaling, *Pur. Agt*.....Albany, N. Y.
Geo. Tefft, *M. M*.....Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 545 m. 321 lo. 33,817 c.
Robt. H. Sayre, *Gen. Supt*.....Bethlehem, Pa.
H. S. Goodwin, *Asst. Gen. Supt*. Bethlehem, Pa.
L. Chamberlain, *Pur. Agt*.....Philadelphia, Pa.
John S. Lentz, *M. C. B*.....Packerton, Pa.
N. J. Div.: H. E. Packer, *Supt*..New York, N. Y.
John I. Kinsey, *M. M*.....So. Easton, Pa.
Coal Rds.: J. I. Blakeslee, *Supt*. Mauch Chunk, Pa.
P. Hofecker, *M. M*.....Weatherly, Pa.
John Campbell, *M. M*.....Delano, Pa.
B. M. Div.: A. G. Brodhead, *S*..Mauch Chunk, Pa.
D. Clark, *M. M*.....Hazleton, Pa.
Wy. Div.: A. Mitchell, *S. & M. M*. Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Supt*.....Sayre, Pa.
J. N. Weaver, *M. M*.....Waverley, Pa.
Lehigh & Hudson River: 4-8½ g.
Grinnell Burt, *Gen. Man. & P. A*...Warwick, N. Y.
W. L. Anderson, *Supt*.....Warwick, N. Y.
Levis & Kennebec Ry. (*See Quebec Central Ry.*)
Ligonier Valley R. R. 3 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*..Pittsburg, Pa.
Geo. Lenft, *Supt. & P. Agt*.....Latrobe, Pa.
Little Rock, Miss. River & Texas Ry.
4-8½ g. 160 m. 12 lo. 260 cars.
J. A. Woodson, *G. S. & P. A*. Little Rock, Ark.
F. Hufsmith, *M. M. & C. B*...Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 168 m. 12 lo. 353 c.
T. Hartman, *Gen. Supt*.....Little Rock, Ark.
James Eblin, *M. M*.....Argenta, Ark.
James Malone, *M. C. B*.....Argenta, Ark.
Long Island R. R. 4-8½ g. 325 m. 79 lo. 740 cars.
I. D. Barton, *Supt*.....Long Island City, N. Y.
Benj. Norton, *Pur. Agt*..Long Island City, N. Y.
C. A. Thompson, *M. M. & C. B*. do.
Long View & Sabine Val. Ry. 3 g. 12 m. 1 lo. 10 cars.
B. Barner, *Pr. & Gen. Supt*.....Long View, Tex.
Louisiana Western R. R. (*See Tex. & N. O.*)
Louisville, New Albany & Chicago Ry.
4-8½ g. 380 miles 33 lo. 2,800 cars.
John MacLeod, *Gen. Supt*.....Louisville, Ky.
H. O. Nourse, *Pur. Agt*.....Louisville, Ky.
Josiah Bettis, *M. M. & C. B*...New Albany, Ind.
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 691 c.
St. J. Boyle, *V. Pr. & Gen. Man*. Louisville, Ky.
R. G. Butler, *Gen. Supt*.....Louisville, Ky.
C. F. Martin, *Pur. Agt*.....Louisville, Ky.
F. M. Mast, *M. M*.....Evansville, Ind.
Louisville & Nashville R. R.
5 g. 2,072 m. 316 lo. 6,131 cars.
Fred. de Funiak, *Gen. Man*.....Louisville, Ky.
G. C. Breed, *A. Gen. Man. & Pur. Agt*. do.
D. W. C. Rowland, *Gen. Supt. Trans*. do.
Reuben Wells, *Supt. Mach*.....Louisville, Ky.
Louisv. Divs.; and Louisv., Cin. & Lex. Ry. (Cin. Div.)
J. G. Metcalf, *Supt*.....Louisville, Ky.
P. Leeds, *M. M.* (Lo. Div.).....Louisville, Ky.
J. W. Luttrell, *M. M.* (Cin. Div.) Louisville, Ky.
W. P. Pike, *M. M.* (2d & C. Div.). Bowling Green, Ky.
Nash. & D. Div.: J. Geddes, *Supt*. Nashville, Tenn.
W. H. Thomas, *M. M*.....Nashville, Tenn.
S. & N. A. Div.: E. Marsh, *Supt*. Birmingham, Ala.
C. W. White, *M. M*.....Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, *Supt*.....Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: J. T. Harrihan, *Supt*. New Orleans, La.
Wm. Adair, *M. M*.....Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt*. Memphis, Tenn.
J. V. Slusser, *M. M*.....Memphis, Tenn.
St. L. Div.: J. Montgomery, *Supt*. Evansville, Ind.
Thos. Walsh, *M. M*.....Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
R. B. Small, *Supt*.....Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m.
J. H. Wilkins, *Pr. & Supt*.....Louisville, Ga.

M

Maine Central R. R. 4-8½ g. 355 m. 58 lo. 1,335 c.
Payson Tucker, *Supt*.....Portland, Me.
Ira K. Russell, *For. Mach. Sh*..Waterville, Me.
C. H. Kenison, *For. Car Sh*.....Augusta, Me.
Manchester & Keene R. R. (*See B. L. & C.*)
B. F. George, *Asst. Supt*.....Keene, N. H.
Manhattan Ry. 4-8½ g. 32 m. 203 lo. 596 pass. c.
Frank K. Hain, *Gen. Man*.....New York, N. Y.
James Tobin, *Pur. Agt*.....New York, N. Y.
C. L. Green, *Supt*.....New York, N. Y.
T. W. Peeples, *M. M*.....New York, N. Y.
H. A. Webster, *M. C. B*.....New York, N. Y.
Marietta & Cin. R. R. 4-8½ g. 312 m. 65 lo. 1,422 c.
Jas. H. Stewart, *Supt*.....Cincinnati, O.
E. Bosley, *M. M*.....Chillicothe, O.
Marietta & North Georgia R. R. 3 g. 24 m. 1 lo. 5 c.
J. B. Glover, *Supt. & P. Agt*.....Marietta, Ga.
E. A. Withers, *M. M*.....Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 87 m. 30 lo. 2,074 cars.
Samuel Schoch, *Gen. Man*.....Marquette, Mich.
R. M. McCauley, *Pur. Agt*.....Marquette, Mich.
W. H. Williams, *M. M*.....Marquette, Mich.
H. D. Lyons, *M. C. B*.....Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m.
N. C. Munson, *Gen. Man*.....Boston, Mass.
E. G. Allen, *Supt. & P. A*.....Boston, Mass.
S. H. Munson, *Supt. M. P*...So. Sudbury, Mass.
McKean & Buffalo R. R. 4-8½ g. 22 m. 2 lo. 8 cars.
S. G. Godden, *Supt*.....Smethport, Pa.
Alex. White, *Pur. Agt*.....Smethport, P.

Memphis & Charleston R. R. (See E. Tenn. Va. & Ga.)
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 272 c.
E. K. Sibley, G. Man. & P. A..Little Rock, Ark.
Wm. E. Smith, Supt.......... Memphis, Tenn.
Thos. Rennell, M. M..........Argenta, Ark.
P. Twitchell, M. C. B..........Argenta, Ark.
Mexican Central Ry.
Rudolph Fink, Gen. Man....... City of Mexico.
J. H. Garner, Supt..............City of Mexico.
Howard Hinckley, Pur. Agt ..Boston, Mass.
F. W. Johnson, M. M............City of Mexico
J. H. O'Brien, M. C. B..........City of Mexico.
Mexican National Ry. (See Tex.-Mex.)
Michigan Cen. R. R. 4-8½ g. 958 m. 233 lo. 6,552 c
H. B. Ledyard, Gen. Man........Detroit, Mich.
E. C. Brown, Asst. Gen. Supt....Jackson, Mich.
Allan Bourn, Pur. Agt...........Detroit, Mich.
S. H. Edgerly, Gen. M. M.........Jackson, Mich.
Robert Miller, Gen. M. C. B......Detroit, Mich.
East. Div.: D. S. Sutherland, Supt. Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, Supt.........Bay City, Mich.
R. P. Baillie, M. M............Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, Supt.............Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, Supt. Chicago, Ill.
Middleburg & Schoharie; and
Schoharie Valley R. Rs. 4-8½ g. 10 m. 2 lo. 4 cars
S. S. Danforth, Gen. Supt....Middleburg, N. Y.
Middleton & Crawford R. R. 4-8½ g. 13 m. 1 lo. 5 c.
D. Thompson, Supt ....Thompson Ridge, N. Y.
Midland of Canada. 4-8½ g. 143 m. 12 lo. 503 cars.
Geo. A. Cox, Gen. Man.....Peterborough, Ont.
W. B. Ferguson, Gen. Supt. Peterborough, Ont.
C. H. Crofts, Storekeeper...Peterborough, Ont.
Wm. Marling, Mech. Supt.......Port Hope, Ont.
Edward Douglas, M. C. B......Port Hope, Ont.
Wm. Polson, M. M. (G. J. Ry.)...Belleville, Ont.
Victoria Div.: F. B. Polson, M. M...Lindsay, Ont.
H. H. Harry, M. C. B...........Lindsay, Ont.
Toronto & Nipissing Div. 3-6 g. 105 m. 12 lo. 211 c.
J. Haggas, M. M............Uxbridge, Ont.
Chas. E. Caron, M. C. B........Uxbridge, Ont.
Midland No. Car. Ry. 4-8½ g. 95 m. 9 lo. 54 cars.
J. B. Yates, Gen. Man..........Newbern, N. C.
Jno. P. Caddagan, Pur. Agt....Newbern, N. C.
J. W. Andrews, Supt...........Goldsboro, N. C.
B. Manly, Supt. of Mach........Newbern, N. C.
Milton & Sutherlin N. G. R. R. 3 g. 7 m. 1 lo. 5 cars.
E. R. Williams, G. Man. & P. Agt...Milton, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 250 m. 28 lo. 809 cars.
H. G. H. Reed, Gen. Man. & P. Agt Milwaukee, Wis.
J. Donahue, Supt..............Milwaukee, Wis.
Chas. S. Hayden, Asst. Supt...Manitowoc, Wis.
David B. Curtis, Asst. Supt.. Oshkosh, Wis
John Hickey, M. M ....Manitowoc, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 42 cars.
Chas. E. Holland, Pr. & Supt...Hancock, Mich.
W. H. Carr, Pur. Agt..........Hancock, Mich.
T. J. Shellhorn, M. M.......... Hancock, Mich.
C. Angie, M. C. B..............Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 m. 2 lo. 2 motors 39 cars.
Wm. McCrory, Supt. & Pur. Agt., and
R. Curtis, M. M...............Minneapolis, Minn.
Minneapolis & St. L. Ry. 4-8½ g. 506 m. 60 lo. 1,850 c.
C. H. Hudson, Gen. Man....Minneapolis, Minn.
E. B. Parke, Pur. Agt.......Minneapolis, Minn.
E. Ryder, Supt...............Minneapolis, Minn.
H. A. Towne, Supt. of Mach. Minneapolis, Minn.
Missisquoi R. R. 4-8½ g. 28 m. 1 lo. 2 cars.
W. C. Smith, Manager..........St. Albans, Vt.
Mississippi Val. & Ship Island. 3-6 g. 20 m. 2 lo. 20 c.
A. L. Jaquith, Supt. & Pur. Agt. Vicksburg, Miss.
Peyton Harrison, M. M........Vicksburg, Miss.
Mississippi & Tenn. R. R. 5 g. 101 m. 11 lo. 194 c
M. Burke, Supt..............Memphis, Tenn.
J. C. Ramsey, M. M ....Memphis, Tenn.
S. J. Bolton, M. C. B............Memphis, Tenn.
Missouri Pacific Ry. 4-8½ g. 2,132 m. 293 lo. 8,035 c.
A. A. Talmage, Gen. Man.........St. Louis, Mo.
A. W. Dickinson, Asst. Gen. Supt. St. Louis, Mo.
R. B. Lyle, Pur. Agt.............St. Louis, Mo.
John Hewitt, Supt. Mach.........St. Louis, Mo.
John Hodge, Supt. Car Dep.......St. Louis, Mo.
Main Line, Warder Cumming, Supt. Sedalia, Mo.
C. L. Dunham, Supt. W'n Kansas City, Mo
Le Roy Bartlett, M. M..........St. Louis, Mo.
Geo. Walshe, M. M.............Sedalia, Mo.
Ks. & Tex. Div., J. M. Eddy, Supt ...Sedalia, Mo.
J. C. Barber, Asst. Supt. Car Dep. Sedalia, Mo.
Wm. T. Small, M. M ....Parsons, Kan.
Dallas, Ex., L. L. Keller, Supt.....Dallas, Tex.
Cen. Br. Div., W. W. Fagan, Supt. Atchison, Kan.
H. V. Faries, M. M..............Atchison, Kan.
S. Irwin, Asst. Supt. Car Dep.. Atchison, Kan
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, Trustee..............Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 5 lo. 80 cars.
W. L. Clark, Gen Supt..........Columbus, Ga.
J. C. Albrecht, M. M.............Columbus, Ga.
A. J. Nix, M. C. B...............Columbus, Ga.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,180 cars.
A. L. Rives, V. Pr. & Gen. Man....Mobile, Ala.
R. H. Briggs, Gen. M. M.........Whistler, Ala.
J. T. Booth, M. C. B............Whistler, Ala.
So'n Div., I. G. Motley, Supt........Mobile, Ala.
John Fitzgerald, M. M...........Macon, Miss.
No'n Div.: E. S. Horsford, Supt. Jackson, Tenn.
M. T. Carson, M. M..............Jackson, Tenn.
Mobile & Spring Hill R. R. 5 g. 8 m. 10 lo. 90 cars.
F. Ingate, Supt....................Mobile, Ala.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 3 cars.
G. B. Weistling, Supt. & P. A....Mont Alto, Pa.
Montgomery & Eufaula Ry. (See Central of Ga.)
Montour R. R. 4-8½ g. 11 m.
C. R. Brown, Supt...............Imperial, Pa.
J. H. Lewis, M. M................Imperial, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 76c.
W. A. Stowell, Supt............Montpelier, Vt.
Montreal, Portland & Boston Ry. 4-8½ g. 18 miles.
Ashley Hibbard, Manager. Frelighsb'g, P. Que.
Montrose Ry. 3 g. 28 m. 2 lo. 3 cars.
J. I. Blakslee, Supt...........Mauch Chunk, Pa.
Morgan's Louisiana & Tex. R. R. 4-8½ g. 165 m.
G. Pandeley, Supt.............New Orleans, La.
C. Trumpy, Pur. Agt. ..... New Orleans, La.
N. Tilton, M. M....................Algiers, La.
Wm. O'Brien, M. C. B............Algiers, La.
Mount Washington Ry. 3⅛ m. 6 lo. 6 pass. cars.
Walter Aiken, Supt.......Franklin Falls, N. H.
Muncy Creek Ry. 4-8½ g. 10 m.
Benj. G. Welch, Rec. & P. Agt. Hughesville, Pa.
J. V. Chamberlain, Supt. & M. M. do.

N

Nantasket Beach R. R. 4-8½ g. 3 m. 2 lo. 6 cars.
Nantucket R. R. 3 g. 3½ miles.
P. H. Folger, Supt...........Nantucket, Mass.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 10 cars.
G. D. Lanphear, Supt..........Peace Dale, R. I.
Nashua & Rochester R. R. (See Wor. & Nash.)
Nashville, Chattanooga & St. Louis R'y.,
5 g. 508 miles 87 lo. 1,521 cars.
F. de Funiak, Gen. Man.........Louisville, Ky.
J. W. Thomas, G. Supt. & P. Agt. Nashville, Tenn.
M. J. C. Wrenne, Supt.........Nashville, Tenn.
James Cullen, M. M ....Nashville, Tenn.
J. G. Sawyer, M. C. B ....Nashville, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 60 m. 4 lo. 32 c.
Belton Mickel, Supt........... Natchez, Miss.
Naugatuck R. R., 4-8½ g. 61 miles, 12 lo. 334 cars.
Geo. W. Beach, Supt...........Waterbury, Ct.
Henry Hanford, M. M.........Bridgeport, Ct.
Geo. W. Gray, M. C. B..........Bridgeport, Ct.
Nevada Central R. R. (See Union Pac.)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, Supt.........Grass Valley, Cal.
Jas. McCormick, M. M. & C. B. Grass Valley, Cal.
New Brunswick Ry. 4-8½ g. 194 m. 12 lo. 266 cars.
E. R. Burpee, Supt..............Gibson, N. B.
Alfred Seely, Pur. Agt..........Gibson, N. B.
Jesse Mathews, M. M.............Gibson, N. B.
T. N. Burpee, M. C. B............Gibson, N. B.
New Brunswick & Can. Ry. 4-8½ g. 127 m. 12 lo. 184c.
Henry Osborn, G. M. & P. A. St. Andrew's, N. B.
John Stewart, Supt..........St. Stephen, N. B.
Thos. Armstrong, M. M.... St. Andrew's, N. B.
G. Houlton, M. C. B........St. Andrew's, N. B.

New Canaan R. R. 4-8½ g. 8 m. 2 lo. 4 cars.
W. E. Raymond, Supt......New Canaan, Conn.
A. Lockwood, M. M.......New Canaan, Conn.
New Castle & Oil City R. R. 4-9 g. 38 m. 4 lo. 30 cars.
A. Vandiwort, Supt.........New Castle, Pa.
New Haven & Derby R. R. 4-8½ g. 13 m. 3 lo. 58 c.
E. S. Quintard, Supt.........New Haven, Conn.
J. M. Whitlock, M. M. & C. B. New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 135 m. 26 lo. 572 c.
C. A. Goodnow, Supt..........New Haven, Ct.
C. N. Yeamans, Pur. Agt ......New Haven, Ct.
Henry Fox, M. M..............New Haven, Ct.
John Sweeny, M. C. B..........New Haven, Ct.
New Jersey & New York Ry. 6 g. 43 m. 6 lo. 40 c.
J. D. Hasbrouck, Gen. Man Jersey City, N. J.
J. S. Drake, Supt. & M. M.......Hillsdale, N. J.
L. B. Van Wagonen, M. C. B ....Hillsdale, N. J.
New Jersey Southern Ry. (See Central, N. J.)
New London Northern R. R (See Central Ver.)
New Orleans Pacific Ry. 5 g. 85 m. 10 lo. 206 cars.
H. S. Morse, Supt..............New Orleans, La.
E. R. Smith, M. M. & C. B... New Orleans, La.
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 9 cars.
L. B. Scofield, Supt..............Selma, Ala.
N. Y. Central & Hudson River R.R.
4-8½ g. 962 m. 676 lo. 22 539 cars.
J. M. Toucey, Gen. Supt...... New York, N. Y.
R. C. Moore, Pur. Agt........ New York, N. Y.
Wm. Buchanan, Supt. M. P.... New York, N. Y.
L. Garey, Supt. Car Dept.... New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, Supt. do.
P. McQ. Gibson, M. M .... New York, N. Y.
C. E. Garey, M. C. B.........Morrisania, N. Y.
Hud. Riv. Div.: C. M. Bissell, Supt. N. York, N. Y.
Peter Smith, M. C. B.........New York, N. Y.
E'n Div.: Zenas C. Priest, Supt .....Utica, N. Y.
G. B. Van Vorst, M. M....West Albany, N. Y.
D. Hoit, M. C. B......... West Albany, N. Y.
W'n Div.: Geo. H. Burrows, Supt. Rochester, N. Y.
Amos Gould, M. M...........E. Buffalo, N. Y.
S. L. White, M. M............Syracuse, N. Y.
E. A. Olmstead, M. C. B....E. Buffalo, N. Y.
C. H. Burchard, M. C. B..E. Rochester, N. Y.
Rd. Donaby, M. C. B....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 269 m. 36 lo. 1,063c.
L. Williams, Gen. Man............ Cleveland, O.
H. L. Morrill, Gen. Supt..........Cleveland, O.
Eas'tn Div.: Wallace McGrath, Supt....Erie, Pa.
Mid. Div.: C. H. Cory, Supt.........Fostoria, O.
West'n Div.: M. E. Wattles, Supt....Chicago, Ill.
New York City & Northern. 4-8½ g. 52 m. 7 lo. 91 c.
F. S. Gannon, Gen. Supt.....High Bridge, N. Y.
M. McNally, M. of M.........High Bridge, N. Y.
New York, Lake Erie & Western R. R.
4-8½ g. 1,020 m. 544 loco. 24,400 cars.
Robt. Harris, V. Pr. & G. Man. New York, N. Y.
E. S. Bowen, Gen. Supt........New York, N. Y.
J. A. Hardenburg, Pur. Agt..New York, N. Y.
F. M. Wilder, Supt. M. P. & M...Susqueh'a, Pa.
E'n Div.: E. O. Hill, Supt.........Jersey City, N. J.
J. H. Vreeland, M. M......Jersey City, N. J.
J. N. Mileham, M. C. B.....Jersey City, N. J.
Del. Div.: Chas. Neilson, Supt. Port Jervis, N. Y.
J. Van Vechten, M. M. & C. B. Pt. Jervis, N. Y.
Susq. Div.: R. B. Cable, Supt...... Elmira, N. Y.
V. Blackburn, M. M.........Susquehanna, Pa.
D. B. Goodell, M. C. B.........Elmira, N. Y.
Buf. & R. Divs.: C. W. Gardner, Supt.; and
G. B. Ross, M. M..............Buffalo, N. Y.
M. Wilder, M. C. B.............Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, Supt do.
W'n Div.: W. B. Coffin, Supt.. Hornellsville, N. Y.
E. H. Griggs, M. M........Hornellsville, N. Y.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 102 lo. 2,416 cars.
E. M. Reed, V. P. & Gen. Man.. New Haven, Ct.
R. N. Dowd, Pur. Agt............New Haven, Ct.
N. Y. & N. H. Div.; J. T. Moody, Supt. New York.
Shore Div.: W. H. Stevenson, Supt. N. Haven, Ct.
H. Kettendorf, Supt. M. P...New Haven, Ct.
Jas. Denver, M. C. B..........New Haven, Ct.
Hart. Div.: C. S. Davidson, Supt....Hartford, Ct.
John Henny, Jr., Supt. M. P. & M. C. B.... do.
New York, Ontario & Western Ry.
4-8½ g. 345 m. 79 lo. 1,539 cars.
Jas. E. Childs, Gen. Supt .. Middletown, N. Y.
Chas. Clark, Pur. Agt........Middletown, N. Y.
Edw. Minshull, M. M. & C. B. Middletown, N. Y.
Mid. Div.: N. R. Hankins, Supt. Middletown, N. Y.
No'n Div.: C. W. Lanpher, Supt....Norwich, N. Y.
New York, Pennsylvania & Ohio R. R.
4-8½ g. 564 m. 215 lo. 7,387 cars.
P. D. Cooper, Gen. Man........Cleveland, Ohio.
J. M. Ferris, Supt. Trans.......Cleveland, Ohio.
J. H. Hoiway, Pur. Agt.......Cleveland, Ohio.
Wm. Fuller, Gen. M. M. & C. B...Cleveland, O.
S. V. Smith, Asst. Gen. M. C. B.....Kent, Ohio.
E'n Div.: A. L. Dunbar, Supt.......Meadville, Pa.
J. A. Cooper, M. M..............Meadville, Pa.
D. S. Dockstader, M. C. B......Meadville, Pa.
J. F. Fosdick, For. Car Rep. Salamanca, N. Y.
W'n Div.: J. W. Alsop, Supt.......... Galion, O.
Wm Hill, M. M......................Galion, O.
J. W. Holmes, For. Car Rep.........Galion, O.
Geo. Wilson, For. Car Rep.... Dayton, Ohio.
Maho'g Div.: N. F. Wood, Asst. Supt. Cleveland, O.
N. Wright, M. M................Cleveland, O.
C. N. Thorp, M. C. B...........Cleveland, O.
New York, Providence & Boston R. R.
4-8½ g. 72 m. 29 lo. 430 cars.
J. B. Gardner, Supt.............Providence, R. I.
Giles F. Ward, Pur. Agt......Stonington, Conn.
J. H. Anderson, M. M. & C. B. Providence, R. I.
N. Y., Susquehanna & W'n. 4-9 g. 86 m. 20 lo. 350 c.
H. M. Britton, Gen. M. & P. A. New York, N. Y.
W. C. Ennis, M. M. & C. B...Wortendyke, N. J.
New York, Texas & Mexican Ry. 4-8½ g. 26 miles.
C. L. Leslie, Gen. Supt.........Rosenberg, Tex.
New York, West Shore & Buffalo Ry.
Chas. Paine, Gen. Man. ....New York, N. Y.
Howard Fry, Supt. M. P......New York, N. Y.
New York, Woodhaven & Rockaway R. R.
4-8½ g. 26 m. 8 lo. 101 cars.
J. M. Lunt, Supt. & P. Agt..Hunter's Pt., L. I.
W. B. Turner, M. M........Hunter's Point, L. I.
N. Y. & Brighton Beach Ry. 3 g. 3 miles.
Geo. Edw. Harding, Gen. Supt. New York, N. Y.
New York & Norfolk R. R. 4-8½ g. 10 m. 1 lo. 4 c.
U. H. Painter, Supt........Pocomoke City, Md
N. Y. & Greenwood Lake Ry. 4-8½ g. 42 m. 8 lo. 53 c.
J. H. Tinney, Acting Supt....Jersey City, N. J.
J. A. Hardenburg, Pur. Agt. Jersey City, N. J.
G. A. Hill, M. M...................Pompton, N. J.
N. Y. & Manhattan Beach Ry. 3 g. 23 m. 12 lo. 128 c.
D. C. Corbin, Man. Dir.........New York, N. Y.
O. Fairhurst, M. M..........Greenpoint, L. I.
New York & New England R. R.
4-8½ g. 463 m. 127 lo. 3,326 cars.
S. M. Felton, Jr., Gen. Man......Boston, Mass.
W. W. McKim, Pur. Agt ....Boston, Mass.
Elias E. Pratt, M. C. B ....Norwood, Mass.
Nor. Div.: P. St. M. Andrews, Supt...Norwich, Ct.
Richard Colburn, M. M..........Norwich, Ct.
Prov. Div.: L. W. Palmer, Supt.. Providence, R. I.
Hfd. Div.: T. W. Kennan, Supt.....Hartford, Ct.
E. M. Humstone, M. M. ....Hartford, Ct.
Newburg, Duchess & Conn. R. R. 4-8½ g. 58 miles.
C. L. Kimball, Gen. Supt. Dutchess Junc., N. Y.
W. G. Van Buskirk, M. M. & C. B. do
Newport & Wickford R. R. 4-8½ g. 3 m. 1 lo. 4 cars.
Theo. Warren, Supt............Newport, R. I.
Norfolk & Western R. R. 5 g. 428 m. 82 lo. 1,220 c.
Henry Fink, 2d V. Pr. & Gen. Man. Lynchb'g, Va.
W. C. De Armond, Pur. Agt...Philadelphia, Pa.
C. Blackwell, Supt. M. P.........Roanoke, Va.
Va. & Tenn. Div.: F. Sterk, M. M. Lynchburg, Va.
Frank Huger, Supt ....Lynchburg, Va.
W. A. Morgan, M. C. B ....Lynchburg, Va.
Nor. & Pt. Div.: N. M. Osborne, Supt.,
J. T. Robinett, M. M. & C. B. Petersburg, Va.
North-Eastern R. R. of Ga. 5 g. 40 m. 2 lo. 18 cars.
H. R. Bernard, Supt..............Athens, Ga.
Jno. J. Longest, M. C. B...........Athens, Ga.
North-Eastern R. R. (S. C.) (See Wil. & Wel.)
North Pacific Coast R. R. 3 g. 80 m. 12 lo. 316 cars.
David Nye, Gen. Supt.........San Rafael, Cal.
W. F. Russell, Pur. Agt ....San Francisco, Cal.
J. Fowler, M. M..................Sancelito, Cal.
North-Western Ohio Ry. (See Penna. Co.)

Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, Supt..............Concord, N. H.
Ed. Studley, M. M. & C. B. & Pur. Agt. do.
Northern (N. J.) R. R. (See N. Y., L. E. & W'n.)
Northern Central Ry. (See Penna. (R. R.)
North'n Pacific R. R. 4-8½ g. 1,193 m. 104 lo. 3,089 c.
Herman Haupt, Gen. Man..... St. Paul, Minn.
John H. Ames, Pur. Agt........St. Paul, Minn.
Geo. W. Cross, Supt. Trans....St. Paul, Minn.
Geo. W. Cushing, Supt. M. P. & M. St. Paul, Minn.
St. P. & Minn. Divs.: B. McHugh, Supt., do.
A. P. Farrar, Supt. Mach.....Brainerd, Minn.
Dakota Div.: C. T. Hobart, Supt......Fargo, Dak.
A. Rupert, M. M.................Fargo, Dak.
Mo. Div.: D. R. Taylor, Supt.... Bismarck, Dak.
E. F. Doran, M. M.............Bismarck, Dak.
(2) Western Div.: J. W. Sprague, Gen. Supt.; and
Otis Sprague, Supt.......New Tacoma, W. T.
H. D. Sanborn, Pur. Agt......Portland, Ore.
F. C. Ford, M. M.........New Tacoma, W. T.
S. Wishart, M. C. B...... New Tacoma, W. T.
Pend d'Ore Div.: H. W. Fairweather, Supt.; and
J. F. Curtis, M. M..........Ainsworth, W. T.
Northern & North-W'n Ry. 5-6 & 4-8½ g. 50 lo. 1,033 c.
James Webster, Supt............Toronto, Can.
C. W. Postlethwaite, Pur. Agt....Toronto, Can.
P. Clarke, M. M.................Toronto, Can.

O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,160 cars.
A. A. Gaddis, Gen. Man..........Malone, N. Y.
Abr. Klohs, Supt. & M. M.........Malone, N. Y.
Ohio Central R. R. 4-8½ g. 230 m. 30 lo. 3,201 cars.
G. G. Hadley, Gen. Man ....Toledo, O.
John E. Martin, Gen Supt...........Toledo, O.
W. H. Vandegrift, Supt ....Toledo, O.
F. W. Stewart, Pur. Agt ....Toledo, O.
J. B. Morgan, M. M. & C. B........Bucyrus, O.
Ohio Southern. 4-8½ g. 116 m. 15 lo. 623 cars.
Ford Woods, Supt...............Springfield, O.
H. C. Norton, Pur. Agt......Indianapolis, Ind.
J. L. Brown, M. M...............Springfield, O.
Ohio & Mississippi Ry. 4-9 g. 615 m. 14 lo. 2,501 cars.
W. W. Peabody, Gen. Supt.......Cincinnati, O.
G. E. Atwood, Pur. Agt..........Cincinnati, O.
Cin. Div.: C. B. Cole, Supt..........Seymour, Ind.
John Thumser, M. M..........Seymour, Ind.
J. P. Coulter, M. C. B............Aurora, Ind.
Arthur Donaldson, M. M......Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, Supt. St. Louis, Mo.
J. W. Stokes, M. M. (Spring. Div.)..Pana, Ill.
Louisv. Div.: C. B. Cole, Supt. .Louisville, Ky.
Oil City & Ridgway R. R. 4-8½ g. 6 m. 1 lo. 43 cars.
A. F. Kent, Gen. Man...............Oil City, Pa.
Old Colony R. R. 4-8½ g. 463 m. 110 lo. 2,862 cars.
J. R. Kendrick, Gen. Supt........Boston, Mass.
Main Li. Div.: J. H. French, Supt...Boston, Mass.
R. W. Husted, Pur. Agt..........Boston, Mass.
J. K. Taylor, M. M ....Boston, Mass.
A. Gleason, M. C. B ....Boston, Mass.
Cape Cod Div.: C. H. Nye, Supt..Hyannis, Mass.
No. Div.: S. A. Webber, Supt....Fitchburg, Mass.
George W. Reynolds, M. M......Taunton, Mass.
Sam. Stevens, M. C. B........ Taunton, Mass
Olean, Bradford & Warren; Bradford; Kinzua; and
Kendall & Eldred R. Rs. 3 g. 38 m. 9 lo. 222 cars.
J. W. Watson, Gen. Supt..........Olean, N. Y.
J. H. Poole, Pur. Agt ....Buffalo, N. Y.
Charles Turner, M. M. & C. B.. ..Olean, N. Y.
Olympia & Tenino R. R. 3 g. 15 miles.
William Mitchell, Supt..........Olympia, W. T.
Ontario Southern Ry. 4-8½ g. 24 m. 3 lo. 40 c.
E. R. Mills, Supt..............Sodus Point, N. Y.
S. B. Stuart, Pur. Agt........Sodus Point, N. Y.
W. H. Cook, M. C. B ....Sodus Point, N. Y.
Oregon Ry. & Nav. Co. 4 8-½ g. 225 m. 31 lo. 930 cars.
C. H. Prescott, Manager...........Portland, Ore.
J. M. Buckley, Asst. Man. & Act. Supt. do.
J. M. Fillmore, Supt. (R. Div.)... Portland, Ore.
K Von Oterendorf, Supt. (O. Div.) S. F'cisco, Cal.
J. M. Drake, Pur. Agt.......... Portland, Ore.
C. C. Hobart, Gen. M. M........The Dalles, Ore.
Chas. A. Phipps, M. C. B..... The Dalles, Ore.
N. G. Div.: Wm. Reed, Man.... ..Portland, Ore.
James Walch, M. M ....Portland, Ore.
Oregon & California R. R. 4-8½ g. 200 m. 14 lo. 286 c.
R. Koehler, Act. Man...........Portland, Ore.
J. Brandt, Gen. Supt............Portland, Ore.
A. Brandt, M. M...................Portland, Ore.
Owensboro & Nashville R. R. 5 g. 35 m.
W. L. Gude, Gen. Supt .. ....Owensboro, Ky.
H. M. Gable, M. M. & C. B....Owensboro, Ky.
Oxford & Henderson R. R. 13 miles.
A. H. A. Williams, Pres..........Oxford, N. C

P

Paducah & Elizabetht'n R.R. 5 g. 186 m. 19 lo. 536 c.
Robert Meek, Gen. Supt ..Elizabethtown, Ky.
W. D. Robb, M. M. & C. B. Elizabethtown, Ky.
Painesville & Youngstown R. R. 3 g. 65 m. 7 lo. 319 c.
E. K. Hyndman, Gen. Man......Pittsburg, Pa.
J. A. Newcome, Supt............Painesville, O.
J. H. Jones, M. M.................Painesville, O.
Panama R. R. 5 g. 58 m. 14 lo. 534 cars.
H. A. Woods, Supt........ Aspinwall, U. S. Col.
E. Z. Penfield, Pur. Agt...... New York, N. Y.
Thomas S. O'Brien, M. M. Aspinwall, U. S. Col.
Parker & Karns City; and
Karns City & Butler R. Rs. 3 g. 27 m. 5 lo. 84 cars.
W. C. Moberly Gen. Supt...... Parker City, Pa.
Philip Davies, M. M............Parker City, Pa.
Wm. Wolford, M. C. B ....Parker City, Pa.
Passumpsic R. R. 4-8½ g. 165 m. 28 lo. 105 cars.
E. Raymond, Pres. & Pur. Agt..Boston, Mass.
H. E. Folsom, Supt.............Lyndonville, Vt.
L. L. Brigham, M. M.......... Lyndonville, Vt.
L. F. Woodard, M. C. B ....Lyndonville, Vt.
Paulding & Cecil Ry. 4-8½ g. 7 m. 2 lo. 24 cars.
S. Frank Eagle, Pres...............Cecil, O.
Paw Paw and Tol. & S. Haven Rds. 3 g. 13 m. 2 lo. 7 c.
J. Ihling, Supt......................Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
Supt. & Pur. Agt....York, Pa.
E. H. Williams, M. C. B...............York, Pa.
E. Div.: S. Dickey, Supt ....Oxford, Pa.
G. R. Dickey, Pur. Agt..............Oxford, Pa.
W. P. Kirk, M. M...................Oxford, Pa.
Pennsylvania Co.'s (9) Roads.
4-9 g. 2,838 m. 817 lo. 29,432 cars.
Wm. Mullins, Gen. Pur. Agt......Pittsburg, Pa.
Joseph Wood, Supt. M. P......Fort Wayne, Ind.
(1) Clev. & Pittsb'g R. R. 4-9 g. 224 m. 97 lo. 3,336 c.
R. V. Smith, Asst. Gen. Man....Cleveland, O.
Philip Bruner, Supt.............Wellsville, O.
W. F. Beardsley, Mast. of Mach. Cleveland, O.
(2 & 3) Erie & Ashtabula Rds. 178 m. 29 lo. 1,340 c.
John M. Kimball, Supt.......Youngstown, O.
J. A. Wood, For. Shops..............Erie, Pa.
(4) Indianap. & Vincennes Rd. 117 m. 11 lo. 303 cars.
Jas. J. Turner, Supt........Indianapolis, Ind.
M. M.
(5) Jeffersonville, Madison & Indianapolis R. R.
4-9 g. 217 m. 47 lo. 784 cars.
E. W. McKenna, Supt.........Louisville, Ky.
Wm. Swanston, M. M.....Jeffersonville, Ind.
Edw. Austin, M. C. B .....Jeffersonville, Ind.
(6) Northwestern Ohio Ry. 4-9 g. 79 m.
J. S. Morris, Supt ....Toledo, O.
(7) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 278 lo. 6,782 cars.
E'n Div.: A. B. Starr, Supt........Allegheny, Pa.
Geo. J. Parkin, M. M...........Allegheny, Pa.
W'n Div.: C. D. Law, Supt.......Ft. Wayne, Ind.
F. D. Casanave, M. M.........Ft. Wayne, Ind.
(8) Pittsburg, Cincinnati & St. Louis Ry.
4-9 g. 1,172 m. 336 lo. 6,482 cars.
Jas. McCrea, Gen. Supt........Columbus, O.
G. W. Rhodes, Supt. M. P. & M....Columbus, O.
P. & Col. Div.: E. B. Taylor, Supt. Dennison, O.
Ross Kells, M. M. ....Dennison, O.
A. K. Mansfield, M. C. B......Steubenville, O.
Robt. Curtis, M. M..............Columbus, O.
Thos. Chamberlain, M. C. B... Columbus, O.
C. & M. V. Div.: W. F. Black, Supt. Zanesville, O.
Leroy Kells, M. M...............Lancaster, O.
Daniel Jewell, M. C. B..........Lancaster, O.
Li. Mi. Div.: Ralph Peters, Supt....Cincinnati, O.
Leroy Kells, M. M...............Cincinnati, O.
M. P. Ford, M. C. B...............Columbus, O.

Ind. Divs.: J. F. Miller, Supt.....Richmond, Ind.
Geo. H. Prescott, M. M ......Logansport, Ind.
Chas. H. Starr, M. C. B......Logansport, Ind.
M. J. Rogers, M. M.........Indianapolis, Ind.
Chi. Div.: C. C. F. Bent, Supt.. Logansport, Ind.
(9) Terre Haute & Indianapolis R. R.
4-9 g. 374 m. 83 lo. 2,868 cars.
Joseph Hill, Gen. Supt..........St. Louis, Mo.
C. R. Peddle, P. Agt. & Supt. M. P. & M.; and
E. D. Carter, M. C. B ....Terre Haute, Ind.
Clinton Idler, M. M........Indianapolis, Ind.
Chas. Butler, M. M...........Effingham, Ill.
A. W. Quakenbush, M. M...Logansport, Ind.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 2,704 m. 1,271 loco. 51,894 cars.
Frank Thomson, Gen Man....Philadelphia, Pa.
Enoch Lewis, Pur. Agt.......Philadelphia, Pa.
John Reilly, Supt. Trans......Philadelphia, Pa.
T. N. Ely, Supt. Mo. Po. (4 Gen. Divs.) Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4-9 g. 1,105 m. 627 lo. 35,583 cars.
Charles E. Pugh, Gen Supt. ....Altoona, Pa.
Phila. Div.: S. M. Prevost, Supt. Philadelphia, Pa.
H. D. Garrett, M. M.... W. Philadelphia, Pa.
I. W. Van Houten, M. C. B.......W. Phila., Pa.
Mid. Div.: H. H. Carter, Supt....Harrisburg, Pa.
E. L. Caum, M. M.............Harrisburg, Pa.
Samuel W. Myers, M. C. B...Harrisburg, Pa.
Alt'a Div.: Wm. J. Latta, Supt......Altoona, Pa.
G. W. Strattan, M. M.............Altoona, Pa.
John P. Levan, M. C. B.. ....Altoona, Pa.
Pitts. Div.: Robert Pitcairn, Supt....Pittsburg, Pa.
D. O. Shaver, M. M................Pittsburg, Pa.
J. G. Stewart, M. C. B............Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, Supt. Blairsville, Pa.
C. B. Street, M. M...............Blairsville, Pa.
M. H. Fails, M. C. B..............Blairsville, Pa.
Fred. Div.: J. B. Hutchinson, Supt.....York, Pa.
Tyrone Div.: S. S. Blair, Supt........Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, Supt. Lewistown, Pa.
Bed. Div.: Thos. A. Roberts, Supt...Bedford, Pa.
Monong. Div.: David M. Watt, Supt. Pittsburg, Pa.
Wm. Lininger, M. M...............Pittsburg, Pa.
(2) United R. Rs. of N. J. Divs. 414 m. 257 lo. 4,668 c.
F. Wolcott Jackson, Gen. St. Jersey City, N. J.
N. Y. Div.: Robt. E. Pettit, Supt. Jersey City, N. J.
H. S. Hayward, At. St. M. P. Jersey City, N. J.
David H. Baker, M. C. B...Jersey City, N. J.
L. A. Bosdevex, M. M. ..Jersey City, N. J.
E. F. Bosdevex, M. C. B....Jersey City, N. J.
Belv. Div.: J. A. Anderson, Supt. Lambertv., N. J.
R. McDowell, M. M.......Lambertville, N. J.
Amboy Div.: J. S. Buckalew, Supt. Camden, N. J.
Thos. Kerr, M. M.......... So. Amboy, N. J.
P. S. Bogart, M. C. B.........So. Amboy, N. J.
(3) West Jersey R. R. 4-9 g. 163 m. 22 lo. 342 cars
Joseph Crawford, Supt ....Camden, N. J.
W. McAllister, M. M...............Camden, N. J.
C. C. Williams, M. C. B...........Camden, N. J.
(4) Phila., Wilm. & Balt. R.R. 212 m. 86 lo. 1,488 c.
H. F. Kenney, Gen. Supt. ....Philadelphia, Pa.
S. A. Hodgman, M. M..........Wilmington, Del.
Wm. Lundgren, M. C. B......Wilmington, Del.
Cen. Div.: L. K. Lodge, Supt.. Philadelphia, Pa.
S. D. Danfield, M. M. & C. B....Chester, Pa.
Del. Div.: I. N. Mills, Supt.....Philadelphia, Pa.
(5) Phila. & Erie R. R. Divs.: 376 m. 117 lo. 3,481 c.
R. Neilson, Gen. Supt.... ...Williamsport, Pa.
R. H. Soule, Supt. Mo. Po....Williamsport, Pa.
E'n. Div.: Thos. Gucker, Supt. Williamsport, Pa.
Sun. H. & W. Div: F. L. Sheppard, Supt.; and
W. F. Beardsley, M. M....... ...Sunbury, Pa.
Mid. Div.: E. B. Westfall, Supt.... ..Renova, Pa.
Wm. L. Holman, M. M.............Renova, Pa.
West'n Div.: J. W. Reynolds, Supt.....Erie, Pa.
W. T. Smith, M. M ....Erie, Pa.
(6) Northern Central Ry. 4-9 g. 326 m. 152 lo. 6,163 c.
A. W. Sumner, Pur. Agt... ....Baltimore, Md.
Susq., Shamokin, Elmira & Canadaigua Divs.:
Robert Neilson, Gen. Supt... Williamsport, Pa.
R. H. Soule, Supt. M. P......Williamsport, Pa.
Susq. Div.: Thos. Gucker, Supt. Williamsport, Pa.
Sham. Div.: Supt.....................Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, Supt..Elmira, N. Y.
Jas. Strode, M. M.................Elmira, N. Y.
J. C. Dyott, M. C. B ....Elmira, N. Y.
Baltimore Divs. of Northern Central: and
(7) Baltimore & Potomac R. R. 128 m. 29 lo. 356 c.
G. C. Wilkins, Supt...............Baltimore, Md.
A. W. Sumner, Pur. Agt... ....Baltimore, Md.
A. O. Dayton, Supt. Mo. Po.... .Baltimore, Md.
J. M. Coale, M. M................Baltimore, Md.
G. W. Demarest, M. C. B.........Baltimore, Md.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 2,871 c.
J. B. Smith, Gen. Supt. ....Dunmore, Pa.
And. Crane, M. M. ....Dunmore, Pa.
Geo. W. Simpson, M. C. B.........Dunmore, Pa.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, Gen. Supt ....Ridgeway, Pa.
Pennsylvania & New York R. R. (See Lehigh.)
Pensacola & Perdido R. R. 6 g. 8 m. 5 lo. 73 cars.
B. F. Simmons, Pr. & Supt.... Pensacola, Fla.
H. W. Simmons, Pur. Agt......Pensacola, Fla.
R. G. Nicholl, M. M. & C. B.....Pensacola, Fla.
People's Ry. 4-8½ g. 6 m. 3 lo. 17 cars.
Chas. Baker, Pres................ Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 215 m. 12 lo. 725 cars.
G. L. Bradbury, Gen. Man.... .... Peoria, Ill.
Supt. & Pur. Agt....Peoria, Ill.
P. Reilly, M. M......................Mattoon, Ill.
Peoria & Farmington R. R. 4-8½ g. 25 m. 2 lo. 25 c.
D. P. Phelps, Gen. Man.........Monmouth, Ill.
John F. Wallace, Supt..........Farmington, Ill.
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 100 c.
Thos. B. Burnett, Gen. Supt. & P. A. Peoria, Ill.
R. F. Hurd, M. M. & C. B...........Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 30 miles.
D. B. Clack, Supt..............Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 131 cars.
R. M. Sully, Gen. Supt.........Petersburg, Va.
L. E. Clark, Pur. Agt..........Petersburg, Va.
R. B. Andrews, M. M..........Petersburg, Va.
J. W. Fleming, M. C. B..........Petersburg, Va.
Phila., Marlton & Medford R. R. (Op. by Cam. & At.)
Phila., Wilmington & Balt. R. R. (See Penna. R. R.)
Phila. & Atlantic City Ry. 3-6 g. 65 m. 11 lo. 134 cars.
Ellis Clark, Supt. & Pur. Agt. Philadelphia, Pa.
J. W. Wright, M. M..............Camden, N. J.
E. Lippincott, M. C. B............Camden, N. J.
Phila. & Reading. 4-8½ g. 869 m. 516 lo. 21,960 cars.
John E. Wootten, Gen. Man..Philadelphia, Pa.
W. S. Wilson, Pur. Agt. ....Philadelphia, Pa.
Geo. Eltz, Supt. Trans............Reading, Pa.
L. B. Paxson, Eng. of Mach.......Reading, Pa.
John H. Rankin, M. C. B...........Reading, Pa.
No. Pa. & B. Brk. Div.: I. A. Sweigard, Supt., and
Jackson Richards, M. M....Philadelphia, Pa.
C. & W. Br.: D. C. Reinhart, Sup. Williamsport, Pa.
W. H. Ellis, M. M...............Catawissa, Pa.
C. D. Ellis, M. C. B.............Catawissa, Pa.
Leb. & Tr. Br.: H. W. Tracy, Supt. Pine Grove, Pa.
Coal Br.: J. H. Olhausen, Supt. Mahony Plane, Pa.
R. & C. Br.: A. M. Wilson, Supt...Columbia, Pa.
P. N. & N. Y. Rd.: W. M. Geary, S. Morristown, Pa.
S. & Le. Rd.: E. Dale, Supt.........Reading, Pa.
Pittsburg, Bradford & Buffalo Ry. 3 g. 31 m. 4 lo. 79c
J. M. Dickey, Gen. Man ....Foxburg, Pa.
M. Mandeville, Supt...............Foxburg, Pa.
Pittsburg, Cincinnati & St. Louis Ry. (See Penna. Co.)
Pittsburg, Ft. Wayne & Chicago Ry. (See Penna. Co.)
Pittsburg Southern Ry. 3 g. 38 m. 4 lo. 64 cars.
Supt. & P. A...Pittsburg, Pa.
W. S. Marshall, M. M............Pittsburg, Pa.
E. B. Gosline, M. C. B.............Pittsburg, Pa.
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 388 c.
James M. Bailey, Gen. Supt.....Pittsburg, Pa.
A. C. Hays, Supt..................Pittsburg, Pa.
Holmes Ward, M. M .....Castle Shannon, Pa.
Wm. E. Long, M. C. B ....Pittsburg, Pa.
Pitts. & Lake Erie R. R. 4-8½ g. 70 m. 30 lo. 1,688 c.
W. C. Quincy, Gen. Man.........Pittsburg, Pa.
R. W. Jones, Mast. Trans.......Pittsburg, Pa.
S. W. Haines, M. M.............Pittsburg, Pa.
Pittsburg & Western R. R. 3 g. 47 m. 2 lo. 76 cars.
E. K. Hyndman, Gen. Man.......Pittsburg, Pa.
C. P. Ford, Pur. Agt.........Allegheny, Pa.
W. L. Hofecker, M. M..........Zelienople, Pa.

Port Huron & No.-Western Ry. 3 g. 105 m. 4 lo. 66 c.
H. McMorran, G. Man. & P. A. Port Huron, Mich.
I. R. Wadsworth, Supt. ... Port Huron, Mich.
Chas. Deifenbaugh, M. M. ... Port Huron, Mich.
Benj. Hillier, M. C. B. ... Port Huron, Mich.
Port Jervis & Monticello R. R. 6 g. 24 m. 2 lo. 13 c.
M. V. Heller, Gen. Man. ... Port Jervis, N. Y.
Port Royal & Augusta Ry. 5 g. 112 m. 13 lo. 235 c.
J. N. Bass, Gen. Supt. ... Augusta, Ga.
Geo. Riley, M. M. ... Port Royal, S. C.
J. H. Milton, M. C. B. ... Port Royal, S. C.
Portland & Ogdensburg. 4–8½ g. 114 m. 9 lo. 289 c.
J. Hamilton, Gen. Supt. & P. A. .. Portland, Me.
Geo. H. Poor, M. M. ... Portland, Me.
W. G. Brewer, M. C. B. ... Portland, Me.
Portland & Rochester R. R. 4–8½ g. 52 m. 7 lo. 230 c.
G. P. Wescott, Supt. & Pur Agt. Portland, Me.
E. H. C. Tompson, For. of Mach. Portland, Me.
David Dow, For. of Car Repairs. Portland, Me.
Potomac, Fred.'g & Pied. R. R. 3 g. 38 m 2 lo. 32 c.
W. M. Crafton, Supt. ... Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4–8½ g. 45 m. 4 lo. 64 c.
J. A. Perkins, Supt. ... Poughkeepsie, N. Y.
John L. Driscoll, M. M. ... Poughkeepsie, N. Y.
Prince Edward Island Ry. 3–6 g. 199 m. 17 lo. 280 c.
L. B. Archibald, Supt. & Pur. Agt.;
Jos. Unsworth, M. Supt. & Storekeeper; and
D. M. Fraser, M. C. B. .. Charlottetown, P. E. I.
Profile & Franconia Notch R. R. 3 g. 13 m. 2 lo. 12 c.
C. H. Greenleaf, Supt. ... Profile House, N. H.
Prospect Park & Coney I'd. 4–8½ g. 13 m. 8 lo. 144 c.
R. Schermerhorn, Supt. ... Coney Island, N. Y.
M. Painter, M. M. ... Brooklyn, N. Y.
Prov., Warren & Bristol R. R. 4–8½ g. 19 m. 5 lo. 38 c.
Waterman Stone, Supt. ... Providence, R. I.
Rufus Smith, M. M. & C. B. ... Bristol, R. I.
Prov. & Springfield R. R. 4–8½ g. 23 m. 3 lo. 83 c.
Wm. Tinkham, Gen. Man. ... Providence, R. I.
G. T. Richardson, M. M. ... Providence, R. I.
Prov. & Worcester. 4–8½ g. 66 m. 30 lo. 858 c.
W. E. Chamberlain, Supt. ... Providence, R. I.
A. Griggs, Supt. L. & C. D. ... Providence, R. I.
Pul'man's Palace Car Co. 472 passenger cars.
A. B. Pullman, 2d V.-Pr. & G. M. .. Chicago, Ill.
Geo. F. Brown, Gen. Supt. ... Chicago, Ill.
Wm. A. Angell, Pur. Agt. ... Chicago, Ill.
S. W. Bretzfield, Asst. Pur. Agt. New York, N. Y.
A. Rapp, Man. (Chicago Works) ... Chicago, Ill.
H. L. Spaulding, Man. (Det Shops). Detroit, Mich.
E. A. Benson, Supt. Shops ... St. Louis, Mo.

Q

Quebec Central Ry. 4–8½ g. 139 m. 3 lo. 79 cars.
A. Steele, Supt. ... Sherbrooke, Que.
R. D. Morkill, Pur. Agt. ... Sherbrooke, P. Q.
Jas. Seiveright, M. M. ... Sherbrooke, P. Q.
Quebec, Montreal, Ottawa & Occidental Ry.
4–8½ g. 329 miles, 34 loco. 556 cars.
L. A. Senecal, Gen. Supt. ... Montreal, Can.
W. E. Blumhart, Pur. Agt. ... Montreal, Can.
A. Davis, Mech. Supt. ... Montreal, Can.
Quebec & Lake St. John Ry. 4–8½ g. 24 m. 3 lo. 43 c.
J. G. Scott, Manager ... Quebec, Can.
Frank Fournier, Supt. ... St. Raymond, P. Q.
John T. Eames, M. M. ... St. Raymond, P. Q.

R

Raleigh & Augusta Air-Line; Carolina Central;
Raleigh & Gaston R. Rs. 4–8½ g. 436 m. 48 lo. 978 c.
John C. Winder, Gen. Man. ... Raleigh, N. C.
Raleigh Rds. 4–8½ g. 194 m. 22 lo. 589 cars.
B. R. Harding, Supt. of Mach. Raleigh, N. C.
R. J. Bishop, M. C. B. ... Raleigh, N. C.
Carolina Cen. R. R. 4–8½ g. 242 m. 26 lo. 389 c.
V. Q. Johnson, Gen. Supt. .. Wilmington, N. C.
C. H. Roberts, Pur. Agt. .. Wilmington, N. C.
James Maglenn, M. of Mach. Laurinburg, N. C.
S. R. Ethridge, M. C. B. ... Laurinburg, N. C.
Rensselaer & Saratoga R. R. (See Del. & Hud. Can. Co.)
Rhinebeck & Connecticut. 4–8½ g. 42 m. 5 lo. 85 c.
J. H. Jones, Gen Supt. ... Rondout, N. Y.
John Dykeman, M. M. ... Rondout, N. Y.
John H. Decker, M. C. B. ... Rondout, N. Y.
Richmond, Fredericksburg & Potomac R. R.
4–8½ g. 83 m. 14 lo. 165 cars.
E. T. D. Myers, Gen. Supt. ... Richmond, Va.
T. L. Courtney, Pur. Agt. ... Richmond, Va.
H. Khun, M. M. ... Richmond, Va.
W. H. Trainham, M. C. B. ... Richmond, Va.
Richmond & Alleghany R. R. 4–9 g. 250 m. 18 lo. 771 c.
Decatur Axtell, Gen. Man. ... Richmond, Va.
Geo. W. Agee, Supt. ... Richmond, Va.
J. P. Williams, Pur. Agt. ... Richmond, Va.
Geo. D. Harris, M. M. & C. B. ... Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,655 miles 217 loco. 3,616 cars.
T. M. R. Talcott, Gen. Man. ... Richmond, Va.
J. P. Minetree, Pur. Agt. ... Richmond, Va.
R. D. Wade, Supt. Mo. Po. ... Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 764 m. 131 lo. 2,480 cars.
Peyton Randolph, As. G. Man. .. Richmond, Va.
Rich. & Dan. Div.: 5 g. 255 m. 79 lo. 1,797 c.
Wm. H. Green, Supt. ... Richmond, Va.
T. W. Gentry, M. M. ... Richmond, Va.
J. B. Vaughan, For. Car Sh. .. Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, Supt. ... Raleigh, N. C.
W. H. Turrentine, M. M. Comp'y's Shops, N. C.
J. C. Holt, For. Car Sh. Comp'y's Shops, N. C.
Atlanta & Char. Air Line. 5 g. 286 m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 37 c.
I. Y. Sage, Supt. ... Atlanta, Ga.
C. D. Wall, M. M. ... Atlanta, Ga.
Z. T. Smith, For. Car Sh. ... Atlanta, Ga.
(2) Charlotte, Col. & Aug. R. R. 5 g. 239 m. 22 lo. 287 c.
G. R. Talcott, Supt. ... Columbia, S. C.
J. H. Green, M. M. (2 roads) ... Columbia, S. C.
J. H. Perkins, For. Car Sh. ... Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 218 c.
J. W. Fry, Supt. ... Columbia, S. C.
J. O. Meredith, For. E. & C. Rep. .. do.
(4) Virginia Midland Ry. 4–8½ g. 353 m. 41 lo. 631 c.
W. M. S. Dunn, Eng. & Supt. Alexandria, Va.
J. E. Waddey, M. of M. ... Alexandria, Va.
J. T. Nalls, M. C. B. ... Alexandria, Va.
Richmond & Petersburg R. R. 4–8½ g. 25 m. 8 lo. 130 c.
J. R. Kenly, Supt. ... Richmond, Va.
John O'Brien, M. M. ... Richmond, Va.
Rio Grande R. R. 3–6 g. 22 m. 3 lo. 39 cars.
M. J. Gomila, Rec. & Gen. Man. Brownsville, Tex.
G. W. Rendall, M. M. ... Brownsville, Tex.
M. Markwood, M. C. B. ... Brownsville, Tex.
Rochester & Lake Ontario Ry. 4–8½ g. 6 m. 2 lo. 10 c.
Henry S. Hebard, Pres. ... Rochester, N. Y.
Rochester & Pittsb'g. R. R. 4–8½ g. 108 m. 11 lo. 612 c.
Geo. E. Merchant, Gen. Man. ... Rochester, N. Y.
J. P. Hovey, M. M. ... Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4–8½ g. 113 m. 12 lo. 357 c.
R. R. Cable, V.-P. & Gen. Supt. Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, A. Supt. & P. A. do
Joseph Elder, M. M. ... Peoria, Ill.
R. I. & M. C. Rd.: B. T. Cable, Supt. R'k Island, Ill.
J. Parks, M. M. ... Rock Island, Ill.
Rockwood & Tennessee Riv. Ry. 3 g. 6. m.
H. Clay Evans, Supt. ... Rockwood, Tenn.
W. F. Shanks, Pur. Agt. ... Rockwood, Tenn.
Rogersville & Jefferson R. R. 5 g. 16 m. 2 lo.
C. M. Lentz, Supt. ... Rogersville, Tenn.
H. M. Aiken, Pur. Agt. ... Rogersville, Tenn.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 13 cars.
Eben Hillyer, Supt. ... Rome, Ga.
O. W. Harbin, M. M. & C. B. ... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4–8½ g. 409 m. 51 lo. 1,248 cars.
E. A. Van Horne, Gen. Supt. ... Oswego, N. Y.
Geo. W. B. Cushing, Pur. Agt. New York, N. Y.
Geo. H. Haselton, M. M. & C. B. Oswego, N. Y.
Rumford Falls & Buckfield R. R. 4–8½ g. 29 m. 2 l. 42 c.
O. Hayford, Supt. ... Canton, Me.
O. Spaulding, Pur. Agt. ... Buckfield, Me.
E. R. Oldham, M. M. ... Buckfield, Me.

S

Sabine & East Texas Ry. 4–8½ g. 25 m. 5 lo. 306 c.
J. B. Morford, Gen. Supt. ... Beaumont, Tex.
R. H. Cousins, Supt. ... Beaumont, Tex.
Sacramento & Placerville R. R. 4–8½ g. 40 m. 3 lo. 68 c.
J. B. Wright, Supt. & P. A. ... Sacramento, Cal.
A. J. Stevens M. M. ... Sacramento, Cal.
Benj. Welch, M. C. B. ... Sacramento, Cal.
Saginaw Bay & Northw'n R. R. 4–8½ g. 20 miles.
E. W. Gerrish, Supt. ... Pinconning, Mich.
F. T. Lillot, Pur. Agt. ... Pinconning, Mich.
And. Miller, M. M. ... Pinconning, Mich.
Saginaw Valley & St. Louis R. R. 4–8½ g. 35 m. 4 l. 64 c.
N. W. Merrill, Supt. ... Saginaw, Mich.
Allan Bourn, Pur. Agt. ... Detroit, Mich.
Geo. C. Watrous, M. M. ... Iona, Mich.
Salem & Eastern R. R. 4–8½ g. 9 miles.
R. T. Parker, Supt. ... Salem, Mo.
Salisbury R. R. 4–8½ g. 9 m. 1 lo. 2 cars.
R. J. Batzer, Supt. ... Meyersdale, Pa.
Sandy River R. R. 2 g. 18 m. 2 lo. 10 cars.
Joel Wilbur, Supt. & Pur. Agt. ... Phillips, Me.
J. Jones, M. M. ... Phillips, Me.
San Francisco & No. Pac. 4–8½ g. 112 m. 11 lo. 244 c.
Arthur Hughes, Gen. Man. .. San Francisco, Cal.
H. C. Whiting, Supt. ... Petaluma, Cal.
P. E. Dougherty, Pur. Agt. San Francisco, Cal.
Ed. Reynolds, M. M. ... Donahue, Cal.
John Martin, M. C. B. ... Donahue, Cal.
San Luis Obispo & Santa Maria Val. R. R. 3 g. 11 m.
C. A. Haskin, Supt. & P. Agt. San Luis Obispo, Cal.
W. H. Masterman, M. M. San Luis Obispo, Cal.
J. M. Vincent, M. C. B. ... San Luis Obispo, Cal.
Santa Cruz R. R. 3 g. 21 m. (See So'n Pac., No'n Div.)
Savannah, Florida & W'n Ry. 5 g. 422 m. 50 lo. 695 c.
H. S. Haines, Gen. Man. ... Savannah, Ga.
R. G. Fleming, Supt. ... Savannah, Ga.
A. A. Aveilhé, Pur. Agt. ... Savannah, Ga.
James D. Hollister, M. of Mach. .. Savannah, Ga.
P. N. Raynal, For. Car Dept. ... Savannah, Ga.
Sav., Griffin & No. Ala. R. R. Op. by Central (Ga.).
Schuylkill & Lehigh R. R. 4–8½ g. 43 miles.
Elbridge Dale, Supt. ... Reading, Pa.
Scoharie Valley R. R. (See Middleburg & Sch.)
Scioto Valley R. R. 4–8½ g. 131 m. 15 lo. 460 cars.
Geo. Skinner, Supt. ... Columbus, O.
C. G. Browning, M. M. & P. A. .. Portsmouth, O.
Seaboard & Roanoke R. R. 4–8½ g. 80 m. 21 lo. 381 c.
E. G. Ghio, Mast. of Trans. ... Portsmouth, Va.
M. M. Pendleton, S. M. P. & M. Portsmouth, Va.
Shenandoah Valley R. R. 4–8½ g. 143 m. 15 lo. 104 c.
J. H. Sands, Supt. ... Hagerstown, Md.
W. C. De Armond, Pur. Agt. Philadelphia, Pa.
Chas. Blackwell, Supt. of M. P. .. Roanoke, Va.
Jno. McCallister, M. M. .. Shepherdstown, W. Va.
H. Groves, M. C. B. .. Shepherdstown, W. Va.
Shenango & Allegheny R. R. 4–9½ g. 47 m. 6 lo. 156 c.
J. T. Blair, G. Supt. & Pur. Agt. Greenville, Pa.
Edw. Richardson, M. M. & C. B. Greenville, Pa.
Shepaug R. R. 4–8½ g. 38 m. 3 lo. 27 cars.
Edwin McNeill, Supt. ... Litchfield, Ct.
C. M. Allen, M. M. ... Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, Supt. & Pur. Agt. ... Ripley, Miss.
W. H. Phelps, M. M. ... Ripley, Miss.
Silver Lake Ry. 6 g. 6 m. 2 lo. 3 cars.
E. G. Matthews, Supt. ... Perry, N. Y.
Sioux City & Pacific R. R. 4–8½ g. 427 m. 21 lo. 594 c.
P. E. Hall, Gen. Man. & P. A. Cedar Rapids, Ia.
J. S. Wattles, Supt. ... Missouri Valley, Ia.
C. F. McCoy, Asst. Supt. ... Blair, Neb.
C. H. Foster, M. M. ... Missouri Valley, Ia.
W. H. Ramseger, Jr., M. C. B. do.
Skaneateles R. R. 4–8½ g. 5 m. 2 lo. 4 cars.
J. McNamara, Supt. ... Skaneateles, N. Y.
Somerset R. R. 4–8½ g. 25 m. 2 lo. 11 cars.
W. M. Ayer, Act. Supt. ... W. Waterville, Me.
E. C. Joy, M. M. ... W. Waterville, Me.
Sonoma Valley (3 g). See San Fran. & No. Pacific.
South Carolina Ry. 5 g. 243 m. 42 lo. 685 cars.
John B. Peck, Gen. Man. ... Charleston, S. C.
S. B. Pickens, Pur. Agt. ... Charleston, S. C.
P. J. Cochrane, Mast. of Mach. Charleston, S. C.
Geo. H. Gramling, M. C. B. ... Charleston, S. C.
South-Eastern Ry. 4–8½ g. 161 m. 14 lo. 446 cars.
Bradley Barlow, Gen. Man. ... St. Albans, Vt.
H. A. Alden, Supt. ... Richford, Vt.
A. G. Eastman, M. M. ... Richford, Vt.
South Florida R. R. 3 gauge 40 m. 4 lo. 20 cars.
B. R. Swoope, Supt. & P. A. ... Sanford, Fla.
C. C. Haskell, Pur. Agt. ... Sanford, Fla.
J. A. Campbell, M. M. ... Sanford, Fla.
A. D. Stentiford, M. C. B. ... Sanford, Fla.
South Mountain R. R. 4–8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, Supt. Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 10 lo. 260 cars.
A. H. Fracker, Gen. Supt. .. San Francisco, Cal.
G. H. Waggoner, Pur. Agt. .. San Francisco, Cal.
E. L. Reese, M. M. & C. B. ... Newark, Cal.
South-Western R. R. (Ga.) (See Central of Ga.)
South-Western Ry. (Ky.) 4–8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, Supt. ... Harrodsburg, Ky.
J. Tomlinson, Pur. Agt. ... Harrodsburg, Ky.
Southern Central R. R. 4–8½ g. 114 m. 16 lo. 447 c.
James G. Knapp, Supt. ... Auburn, N. Y.
H. D. Titus, Pur. Agt. ... Auburn, N. Y.
Chas. G. Brown, M. M. ... Auburn, N. Y.
H. Mooney, M. C. B. ... Auburn, N. Y.
Southern Maryland R. R. 4–9 g. 47 m.
Shields Burr, Supt. ... Brandywine, Md.
C. J. Royce, M. M. ... Brandywine, Md.
Southern Pacific R. R. 4–8½ g. 161 m. 29 lo. 728 c.
Northern Div. (For other Divs. see Cen. Pac.)
A. C. Bassett, Supt. ... San Francisco, Cal.
J. R. Watson, Pur. Agt. ... Sacramento, Cal.
J. T. Wilson, M. M. ... San Francisco, Cal.
F. N. Bellisle, M. C. B. ... San Francisco, Cal.
Springfield, Effingham & So.-Eastern and
Bloomfield Rys. 3 g. 89 m.
W. C. Lyon, Gen. Man. ... Robinson, Ill.
E. Pratt Buell, Pur. Agt. ... Effingham, Ill.
J. S. Pickering, M. M. & C. B. ... Effingham, Ill.
Spring Hill & Parrsboro Ry. 4–8½ g. 32 m. 1 lo. 64 c.
J. Killam, Supt. ... Parrsboro, N. S.
K. McKinnon, M. M. ... Parrsboro, N. S.
Springville & Sardinia Ry. 3 g. 12 m. 2 lo. 9 c.
B. Chafee, Pres. ... Springville, N. Y.
St. Clairsville Ry. 3 ft. gauge 7 miles 1 lo. 3 cars.
J. H. Patterson, Gen. Man. ... St. Clairville, O.
St. Croix & Penobscot R. R. 4–8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, Supt. & Pur. Agt. .. Calais, Me.
G. H. Corsen, M. M. ... Milltown, Me.
H. C. Tincker, M. C. B. ... Milltown, Me.
St. Joe & Desloge Ry. 3 ft. gauge.
J. Naramore, Supt. ... Bonne Terre, Mo.
St. John & Maine Ry. 4–8½ g. 92 m. 6 lo. 110 cars.
H. D. McLeod, Supt. & P. Agt. ... St. John, N. B.
A. McIntyre, M. M. ... St. John, N. B.
St. John's Ry. 4–8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, Pr. & Supt. .. Jacksonville, Fla.
Geo. Ferro, M. of Mach. ... Tocoi, Fla.
St. Johns & Lake Eustis Ry. 3 g. 26 m.
T. S. Davies, Supt. ... Volusia, Fla.
St. Johnsb'ry & Lake Champ 4–8½ g. 120 m 10 lo. 197 c.
A. B. Jewett, Supt. & P. A. .. St. Johnsbury, Vt.
Geo. E. Howe, M. M. & C. B. St. Johnsbury, Vt.
St. Joseph & Des Moines R. R. (See K. C., St. J. & C. B.)
St. Lawrence & Ottawa Ry. 4–8½ g. 59 m. 10 l. 146 c.
Archer Baker, Gen. Supt. ... Ottawa, Can.
alvin Dame, M. M. & C. B. ... Prescott, Can.
St. Louis, Alton & Terre Haute R. R.
Main Line. (See Ind. & St. L. Div.: Ohio Ry.)
St. Louis & Cairo Div.: 4–8½ g. 123 m. 16 lo. 778 c.
G. W. Parker, Gen. Man. ... St. Louis, Mo.
J. L. Hinckley, Supt. ... Belleville, Ill.
A. M. De Clerq, M. M. ... St. Louis, Mo.
St. Louis Bridge Co. and Tunnel R. R.
4–8½ g. 17 m. 15 lo. 11 cars.
Wm. Taussig, Gen. Man. ... St. Louis, Mo.
G. O. Clinton, Supt. ... St. Louis, Mo.
E. J. Brandley, Pur. Agt. ... St. Louis, Mo.
H. M. Smith, M. M. ... St. Louis, Mo.
St. Louis Coal R. R. 4–8½ g. 28 m. 1 lo. 78 cars.
Jas. Prentice, Supt. ... Carbondale, Ill.
Jas. C. Bryden, Pur. Agt. ... St. Louis, Mo.
St. Louis, Ft. Scott & Wichita R. R. 4–8½ g. 20 miles.
F. Tiernan, V. P. & Gen. Man. .. Fort Scott, Kan.
J. D. Hill, Gen. Supt. ... Fort Scott, Kan.
S. C. Young, M. M. ... Ft. Scott, Kan.
A. A. Lydell, M. C. B. ... Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4–8½ g. 59 m. 1 lo. 23 c.
W. W. Walker, Supt. ... Hannibal, Mo.
Geo. Douglass, Pur. Agt. ... Hannibal, Mo.
St. Louis, Iron Mountain & Southern Ry. (1);
International & Great Northern R. R. (2); and
Texas & Pacific Ry. (3).
4–8½ g. 2,678 m. 302 lo. 6,119 cars.
H. M. Hoxie, Gen. Man. ... St. Louis, Mo.
R. B. Lyle, Gen. Pur. Agt. ... St. Louis, Mo.
(1) St. L., I. Mt. & So. 4–8½ g. 710 m. 137 lo. 4,081 c.
E. L. Dudley, Supt. ... St. Louis, Mo.
O. A. Haynes, Supt. Mach. ... De Soto, Mo.
Oscar Doolittle, M. C. B. ... St. Louis, Mo.
St. Louis Div.: J. J. Frey, Supt. ... St. Louis, Mo.
W. H. Harris, M. M. ... De Soto, Mo.
Ark. Div.: Wm. Kerrigan, Supt. Little Rock, Ark.
R. M. Richardson, M. M. & C. B. do.
(2) Inter. & Gr't No'n R. R. 4–8½ g. 776 m. 45 lo. 932 c.
Jos. Herrin, Supt. ... Palestine, Tex.
R. H. Johnson, M. M. ... Palestine, Tex.
H. H. Sessions, M. C. B. ... Palestine, Tex.
(3) Texas & Pac. Ry. 4–8½ g. 1,030 m. 120 lo. 1,106 c.
Geo. L. Sand, Asst. Gen. Supt. ... Marshall, Tex.
J. F. Sechler, Gen. M. M. ... Marshall, Tex.
H. H. Sessions, M. C. B. ... Marshall, Tex.
So'n Div.: Hugh Irvine, Supt. ... Longview, Tex.
W. Garrison, M. M. ... Marshall, Tex.
Tr. Con. Div.: Supt. ... Texarkana, Ark.
Wilson Garrison, M. M. ... Texarkana, Ark.
W'n Div.: Wm. Davis, Supt. ... Ft. Worth, Tex.
W. H. Reilly, Asst. G. M. M. Fort Worth, Tex.
St. L. Keokuk & No.-W'n. 4–8½ g. 187 m. 14 lo. 312 c.
J. W. Smith, Gen. Supt. & P. Agt. ... Keokuk, Ia.
Wm. H. Bartlett, M. M. ... Keokuk, Ia.
St. L., Salem & Little Rock. 4–9 g. 69 m. 5 lo. 103 c.
H. A. Crawford, V. Pr. & P. A. ... St. Louis, Mo.
E. B. Sankey, Supt. ... Salem, Mo.
Thomas Everson, M. M. ... Steelville, Mo.
J. W. Houston, M. C. B. ... Steelville, Mo.
St. L., Van. & T. H. (See T. H. & I. Div. of Penna. Co.)
St. Louis & Cairo R. R. 3 g. 146 m. 22 lo. 708 cars.
Chas. Hamilton, Gen. Supt. ... St. Louis, Mo.
R. M. Pringle, M. M. ... East Carondelet, Ill.
St. L. & San Fran. Ry. 4–8½ g. 695 m. 71 lo. 2,490 c.
C. W. Rogers, 2d V. Pr & G. Man. .. St. Louis, Mo.
D. H. Nichols, Mast. Tran. .. No. Springfield, Mo.
A. G. Thompson, Pur. Agt. ... St. Louis, Mo.
M. Kearney, M. M. & C. B. ... St. Louis, Mo.
Mo. & Ark. Div.: W. A. Thoms, Supt. do.
Kan. Div.: J. R. Wentworth, Supt. Neodesha, Kan.
St. Martin's & Upham Ry. 4–8½ g. 30 m. 1 lo.
A. E. Killam, Manager ... St. Martin's, N. B.
St. Paul, Minneapolis & Manitoba Ry.
4–8½ g. 1,050 m. 116 lo. 3,116 cars.
A. Manvel, Gen. Man. ... St. Paul, Minn.
H. C. Ives, Asst. Gen. Man. ... St. Paul, Minn.
E. B. Wakeman, Supt. Trans. ... St. Paul, Minn.
J. C. Morrison, Pur. Agt. ... St. Paul, Minn.
H. Middleton, M. M. & C. B. ... St. Paul, Minn.
Breck. Div.: A. Guthrie, Supt. ... St. Paul, Minn.
F. F. Div.: J. B. Rice, Supt. ... St. Paul, Minn.
No'n Div.: D. K. Smith, Supt. ... Crookston, Minn.
St. Paul & Duluth R. R. 4–8½ g. 196 m 24 lo. 580 c.
S. R. Stimson, Gen. Supt. ... St. Paul, Minn.
J. G. Callahan, Pur. Agt. ... St. Paul, Minn.
W. McFarland, M. M. ... St. Paul, Minn.
John Hill, M. C. B. ... St. Paul, Minn.
State Line & Sullivan R. R. 4–8½ g. 29 m. 2 lo. 3 c.
J. O. Blight, Supt. ... Towanda, Pa.
Staten Island R. R. 4–8½ g. 13 m. 4 lo. 17 c.
John W. Wilber, Supt. ... Tottenville, N. Y.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, Supt. ... Sloatsburg, N. Y.
Stony Creek R. R. 4–8½ g. 10 miles.
Geo. B. Boggs, Supt. ... Norristown, Pa.
Howard Boyd, Pur. Agt. ... Norristown, Pa.
Strasburg R. R. 4–8½ g. 5 miles.
Isaac Phenegar, Lessee ... Leman Place, Pa.
Sussex R. R. (See Del., L. & W.)
Syracuse, Binghamton & N. Y. R. R. (See D. L. & W.)
Syracuse, Chenago & N. Y. 4–8½ g. 44 m. 4 lo. 60 c.
Albert Allen, Supt. ... Syracuse, N. Y.
George W. West, M. M. ... Syracuse, N. Y.
Wm. J. McMichael, M. C. B. ... Syracuse, N. Y.
Syracuse, Geneva & Corning; Corning, Cowanasque
& Antrim R. Rs. 4–8½ g. 121 m. 23 lo. 1,044 c.
A. H. Gorton, Supt. ... Corning, N. Y.
Andrew Beers, Pur. Agt. ... Corning, N. Y.
O. C. Patchell, M. M. ... Corning, N. Y.
C. J. Butler, M. C. B. ... Corning, N. Y.

T

Talbotton R. R. 7 miles.
W. H. Martin, Supt. ... Talbotton, Ga.
Terre Haute & Indianapolis R. R. (See Penna. Co.)
Terre Haute & Logansport R. R. (Op. by T. H. & Ind.
Terre Haute & So.-Eastern Ry. 4–9 g. 40 miles.
Geo. Atherton, Supt. ... Terre Haute, Ind.
Texas-Mexican; and Mexican National Rys.
3 g. 217 m. 19 lo. 326 cars.
G. C. Gardner, Gen. Man. ... New York, N. Y.
A. R. Roberts, Pur. Agt. ... New York, N. Y.
S. T. Fuller, Gen. Supt. ... Corpus Christi, Tex.
Wm. Sutcliffe, M. M. & C. B. do.
Mex. Nat. Ry.: J. C. Monroe, M. M. .. Mexico, Mex.
Maj. W. J. Brokaw, M. M. ... Manzanillo, Mex.
Texas Western Ry. 3 g. 42 m. 2 lo. 34 cars.
J. W. Goodwin, Supt. ... Houston, Tex.
T. F. Glispin, M. M. ... Houston, Tex.
Texas & New Orleans; Louisiana W'n R. Rs.
4–8½ g. 217 m. 25 lo. 900 c.
J. F. Crosby, Gen. Man. ... Houston, Tex.
P. B. Watson, Pur. Agt. ... Houston, Tex.
C. A. Burton, Supt. ... Houston, Tex.
D. C. Smith, M. M. ... Houston, Tex.
J. M. Mather, M. C. B. ... Houston, Tex.
Texas & Pacific Ry. (See St. L., Iron M. & S'n. R. R.)
Texas & St. Louis Ry. 3 g. 258 m. 15 lo. 280 cars.
J. B. Van Dyne, Gen. Supt. ... Tyler, Tex.
F. W. Paramore, Pur. Agt. ... St. Louis, Mo.
L. B. Fisher, Pur. Agt. ... Tyler, Texas.
W. J. Lewis, M. M. ... Tyler, Tex.
Tioga and Elmira State Line R. Rs.
4–8½ and 6 g. 54 m. 17 lo. 953 cars.
L. H. Shattuck, Supt. ... Blossburg, Pa.
James A. Drake, Pur. Agt. ... Elmira, N. Y.
Pere Bonny, M. M. ... Blossburg, Pa.
D. H. Stratton, M. C. B. ... Blossburg, Pa.
Toledo, Ann Ar. & Gr. Tr. Ry. 4–8½ g. 84 m. 7 lo. 107 c.
M. D. Woodford, Gen. Man. .. Ann Arbor, Mich.
H. W. Ashley, Supt. & Pur. Agt. do
C. C. Dodge, M. M. ... Ann Arbor, Mich.
Toledo, Delphos & Burl. R. R. 3 g. 422 m. 21 lo. 694 c.
T. A. Phillips, Gen. Man. ... Toledo, O.
J. H. F. Wiers, Supt. Mach. & P. Agt. Toledo, O.
Tol. & Day. Div.: A. M. Matheany, Supt.; and
A. T. Stewart, M. M. ... Delphos, O.
S.-E'n Div.: R. B. Jones, Supt. ... Dayton, O.
F. McCreary, M. M. ... Dayton, O.
Toledo & South Haven R. R. (See Paw Paw.)
Tonawanda Valley R. R. 3 g. 19 m. 1 lo. 13 cars.
J. V. D. Loomis, Supt. ... Attica, N. Y.
Toronto, Grey & Bruce Ry. 4–8½ g. 191 m 20 lo 446 c.
Edmund Wragge, Gen. Man. ... Toronto, Can.
W. Watson, Pur. Agt. ... Toronto, Can.
David Preston, M. M. ... Toronto, Can.
Troy & Boston R. R. 4–8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, Pres. & Pur. Agt. ... Troy, N. Y.
Joseph Crandell, Supt. ... Troy, N. Y.
Z. B. Davis, M. M. ... Troy, N. Y.
R. V. Coon, M. C. B. ... Troy, N. Y.
Tuckerton R. R. 4–8½ g. 31 m. 2 lo. 28 cars.
J. J. Pharo, Supt. ... Tuckerton, N. J.
Tuskegee R. R. 3 g. 5 m 1 lo. 6 cars.
W. H. Wright, Supt. ... Tuskegee, Ala.

U

Ulster & Delaware R. R. 4–8½ g. 74 m. 7 lo. 142 cars.
Jas. H. Jones, Supt. ... Rondout, N. Y.
Geo. W. Wright, M. M. ... Rondout, N. Y.
John H. Decker, M. C. B. ... Rondout, N. Y.
Union Pacific Ry. (4 Gen. Divs.)
3 & 4–8½ g. 4,270 m 318 lo. 6,157 cars.
S. H. H. Clark, Gen. Man. ... Omaha, Neb.
Thos. L. Kimball, Asst. Gen Man. Omaha, Neb.
A. D. Clarke, Pur. Agt. ... Omaha, Neb.
(1) Union Div.: Gen Supt. ... Omaha, Neb.
I. H. Congdon, Gen. M. M. ... Omaha, Neb.
Geo. E. Stevens, Supt. Car Dept. Omaha, Neb.
East. Divs.: P. J. Nichols, Supt. ... Omaha, Neb.
Robt. McConnell, M. M. ... Omaha, Neb.
A. M. Collett, M. C. B. ... Omaha, Neb.
Jas. H. McConnell, M. M. ... No. Platte, Neb.
A. Reis, For. Car. Sh. ... No. Platte, Neb.
Mtn. Div.: Robt. Law, Supt. ... Cheyenne, Wy. T.
T. A. Davies, M. M. ... Cheyenne, Wy. T.
J. E. Davies, For. Car. Sh. .. Cheyenne, Wy. T.
Lar. Div.: E. Dickinson, Supt. ... Laramie, Wy. T.
R. Galbraith, M. M. ... Laramie, Wy. T.
R. M. Galbraith, M. M. ... Rawlins, Wy. T.
Frank Blake, For. Car. Sh. ... Rawlins, Wy. T.
West. Div.: W. B. Doddridge, Supt. Evanston, Wy. T.
C. C. Quinn, M. M. ... Evanston, Wy. T.
R. V. Brinkley, For. Car. Sh. Evanston, Wy. T.
Utah Nor. Div.: G. W. Thatcher, Supt., Logan, U.
R. Craft, M. M. ... Logan, U.
F. Reardon, M. M. ... Eagle Rock, Idaho.
F. M. Shoemaker, For. Car. Sh. Eagle R'k, Ida.
Col. Div.: A. A. Egbert, Supt. ... Denver, Col.
Fred. Metzheimer, M. M. ... Golden Col.
E. G. Thomas, For. Car. Sh. ... Golden, Col.
St. J. & W'n. Rd.: L. D. Tuthill, Supt. St. Joseph, Mo.
E. Sleppy, M. M. ... Grand Island, Neb.
E. Hansen, For. Car. Sh. ... Elwood, Kan.
(2) Kansas Div.: S. T. Smith, G. Supt. Kansas C'y, Mo.
Jno. Mackenzie, Supt. Mach. Armstrong, Kan.
T. B. Roberts, M. C. B. ... Armstrong, Kan.
K. Val. Div.: J. O. Brinkerhoff, Supt. Kan. C'y, Mo.
Jas. Mackenzie, M. M. ... Armstrong, Kan.
Smoky Hill & Denver Divs.:
O. H. Dorrance, Supt. ... Wallace, Kan.
J. B. Dailey, M. M. (S. H. Div.) ... Ellis, Kan.
Chey. Div.: A. A. Egbert, Supt. ... Denver, Col.
R. McDougall, M. M. (D. & C. Divs.) Denver, Col.
W. Ogle, For. Car. Sh. (D. & C. Divs.) do.
Kan. Cen. Div.: 3 g. 150 miles.
W. J. Kelley, Supt. ... Leavenworth, Kan.
Wm. McCall, M. M. ... Leavenworth, Kan.
W. S. Roach, M. C. B. ... Leavenworth, Kan.
(3) Denver & South Park Div. 3 ft. gauge 227 miles.
C. W. Fisher, Gen Supt. ... Denver, Col.
J. H. Kirk, M. M. ... Denver, Col.
(4) Nevada Central Ry. 3 g. 93 m. 5 lo. 82 cars.
F. W. Dunn, Supt. ... Battle Mountain, Nev.
Z. T. Spriggs, M. M. ... Battle Mountain, Nev.
United States Rolling Stock Co. 23 lo. 4,834 cars.
A. Hegewisch, Pres. ... New York, N. Y.
C. F. Jauriet, Gen. M. M. & P. A. .. Chicago, Ill.
Utah Central Ry. 4–8½ g. 280 m.
John Sharp, Gen. Supt. ... Salt Lake City, Utah.
S. H. Hill, Pur. Agt. ... Salt Lake City, Utah.
W. B. Armstrong, M. M. .. Salt Lake City, Utah.
Peter Reid, M. C. B. ... Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m.
W. W. Ritter, Gen. Man. ... Salt Lake City, Utah.
Robert Anderson, M. M. ... Salt Lake City, Utah.
Utah & Pleasant Valley Ry. 60 m.
G. M. Young, Man. ... Salt Lake City, Utah.
Utica, Ithaca & Elmira Ry. 4–8½ g. 127 m. 11 lo. 152 c.
G. Jas. Rice, Pres & Supt. Horse Heads, N. Y.
J. L. Greatsinger, Pur. Agt. ... Breesport, N. Y.
Geo. W. Cleveland, M. M. ... Breesport, N. Y.
Wm. Ells, M. C. B. ... Breesport, N. Y.
Utica, & Black Riv. R. R. 4–8½ g. 180 m. 22 lo. 329 c.
J. F. Maynard, Gen. Supt. & P. A. .. Utica, N. Y.
John Bailey, M. M. ... Utica, N. Y.
David James, M. C. B. ... Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4–8½ g. 30 m. 2 lo. 19 c.
G. B. Stevenson, Gen. Supt. ... Vacaville, Cal.
Valley Ry. 4–8¾ g. 59 m. 10 lo. 317 cars.
Samuel Briggs, Supt. ... Cleveland, O.
B. C. Bosworth, M. M. ... Cleveland, O.
Chas. Blanchard, M. C. B. ... Cleveland, O.
Vermont Valley & Sullivan R. Rs. (See Conn. Riv.)
Vernon, Greensburg & Rushville R. R. 25 m.
Horace Scott, V.-Pres. ... Greensburg, Ind.
Vicksburg, Shreveport & Pacific, and
Vicksburg & Meridian R. Rs. (See Cin., N. O. & T. P.
Virginia Midland Ry. (See Rich. & Dan.)
Virginia & Truckee R. R. 4–8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 150 m. 4 lo. 76 c.
H. M. Yerington, Gen. Supt. ... Carson, Nev.
R. J. Laws, Supt. (C. & Co.) ... Carson, Nev.
C. P. Mason, Pur. Agt. ... Carson, Nev.
I. N. Fording, M. M. ... Carson, Nev.
B. F. Lyon, M. C. B. ... Carson, Nev.

W

Wabash, Chester & W'n R. R. 4–8½ g. 42 m. 2 lo. 32 c.
J. L. Hinckley, Gen. Supt. ... Chester, Ill.
Wabash, St. Louis & Pacific Ry. (3 Gen. Divs.)
4–8½ g. 3,241 m. 559 lo. 17,230 cars.
John C. Gault, Gen. Traffic Man. St. Louis, Mo.
Robert Andrews, Gen. Supt. ... St. Louis, Mo.
Asst. Gen. Supt. ... St. Louis, Mo.
R. W. Green, Pur. Agt. ... St. Louis, Mo.
Jacob Johann, Gen. M. M. ... Springfield, Ill.
U. H. Kohler, Gen. M. C. B. ... Toledo, O.
(1) Eas'n Div.: J. B. Barnes, M. M. Fort Wayne, Ind.
U. H. Kohler, Gen. M. C. B. ... Toledo, O.
G. W. Stevens, Supt. ... Fort Wayne, Ind.
Ohio & Ind. Div.:
Peru Div.: E. C. Murphy, Supt. ... Peru, Ind.
John McKenna, M. M. ... Peru, Ind.
Cairo Div.: D. G. Moore, Supt. ... Cairo, Ill.
A. Van Tuyl, M. M. ... Carmi, Ill.
(2) Middle Div.: J. Johann, Gen. M. M. Springfield, Ill.
R. M. Hemphill, M. C. B. ... Peoria, Ill.
Ill. Div.: H. F. Clark, Supt. ... Springfield, Ill.
B. B. Rose, M. C. B. ... Decatur, Ill.
Chicago Div.: A. A. Hobart, Supt. ... Chicago, Ill.
Peoria Div.: F. L. Tomkins, Supt. ... Peoria, Ill.
Wm. O. Hewitt, M. M. ... Peoria, Ill.
Rant'l Div.: B. F. Mathias, Supt. ... Rantoul, Ill.
J. McCarthy, M. M. ... Rantoul, Ill.
(3) Western Div.: W. H. Selby, M. M. .. Moberly, Mo.
C. S. Buck, M. C. B. ... Moberly, Mo.
Missouri Div.: R. S. Miner, Supt. .. Moberly, Mo.
C. B. & O. Div.: J. W. Blanchard, Supt.; and
J. S. Hazen, M. C. B. ... Stanberry, Mo.
Quincy Div.: F. D. Schermerhorn, S. .. Quincy, Ill.
Iowa Div.: E. N. Armstrong, Supt. .. Keokuk, Ia.
D. Moin. Div.: H. B. Skeele, Supt. .. Des Moines, Ia.
Walla Walla & Columbia Riv. R. R. (See Ore. Ry.
Walkill Ry. 4–8½ g. 117 m. 9 lo. 169 cars.
G. H. Graves, Supt. ... Rondout, N. Y.
J. B. Dykeman, M. M. ... Rondout, N. Y.
John H. Decker, M. C. B. ... Rondout, N. Y.
Wasatch & Jordan Val. R. R. (See Bing., Can. & C. F.)
Geo. M. Young, Supt. ... Salt Lake City, Utah.
Warwick Valley R. R. 4–8½ g. 28 m. 2 lo. 18 cars.
Grinnell Burt, Pres. & Pur. Agt. Warwick, N. Y.
S. Mills, M. M. ... Warwick, N. Y.
Washington & Ohio R. R. 4–8½ g. 52 m. 5 lo. 83 c.
R. H. Havener, Gen. Supt. ... Alexandria, Va.
Edward Dunn, M. M. ... Alexandria, Va.
John Harrison, M. C. B. ... Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 28 m. 3 lo. 15 c.
J. G. Ritchie, Supt. ... Waynesburg, Pa.
G. E. Huggins, M. C. B. ... Waynesburg, Pa.
Welland Ry. 4–8½ g. 25 m. 3 lo. 147 cars.
William Pay, Supt. ... St. Catharines, Ont.
Jas. Taylor, M. M. ... St. Catharines, Ont.
Wm. H. Pay, M. C. B. ... St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m.
Rolla Wells, Supt. ... St. Louis, Mo.
M. M. Hodgman, M. M. ... Florissant, Mo.
West Feliciana R. R. 4–8½ g. 27 m. 2 lo. 22 cars.
J. B. McGehee, Pr. & Gen. Supt. Bayou Sara, La.
J. A. Tilton, M. M. & C. B. ... Bayou Sara, La.
West Jersey R. R. (See Penn. R. R.)
West Virginia, Central & Pittsb'g Ry. 13 m. 3 lo. 19 c.
W. E. Porter, Gen. Supt. ... Piedmont, W. Va.
W. T. Blackiston, Pur. Agt. ... Piedmont, W. Va.
E. W. Lippencott, M. M. & M. C. B. .. Piedmont.
Western R. R. (of Ala.) 5 g. 88 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 20 c.
Cecil Gabbett, Gen. Man. & Supt. .. Mont., Ala.
Robert King, M. M. ... Montgomery, Ala.
F. M. Wade, M. C. B. ... Montgomery, Ala.
Western Counties' Ry. 4–8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, Supt. ... Yarmouth, N. S.
Western Maryland R. R. 4–8½ g. 157 m. 16 lo. 394 c.
J. M. Hood, Pr. & Gen. Man. ... Baltimore, Md.
R. J. Adair, Pur. Agt. ... Baltimore, Md.
David Holtz, Mast. of Mach. Union Bridge, Md.
J. H. Nussear, M. C. B. ... Union Bridge, Md.
Western No. Carolina R. R. 4–8½ g. 155 m. 6 lo. 36 c.
V. E. McBee, Supt. ... Salisbury, N. C.
Geo. P. Erwin, Pur. Agt. ... Salisbury, N. C.
G. W. Gates, M. M. ... Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 48 lo. 952 c.
R. A. Anderson, Gen. Supt. ... Atlanta, Ga.
W. R. Webster, Pur. Agt. ... Atlanta, Ga.
John H. Flynn, M. M. ... Atlanta, Ga.
W. G. Gramling, M. C. B. ... Atlanta, Ga.